

# 4 Higher education and research in Kuwait

---

This chapter presents the Higher education and research activity in Kuwait. It starts with a brief overview of the general principles that govern effective higher education and research based on international experience. It then successively reviews the main public and private higher education institutions, and the research institutes, KISR in the first place. A final section discusses KFAS supports to research activities.

---

A higher education and research system is instrumental for supporting endogenous production of knowledge, pushing the knowledge frontier and supporting innovation, provided efficient transmission and diffusion mechanisms are in place. In addition, it strengthens the capacity to adopt and adapt international knowledge and maintains links to developments in science and technology worldwide. This function of science is particularly important for smaller countries and countries at a relatively early stage of development of their innovation capabilities to support the catch-up process.

In the Gulf region, Kuwait was among the first countries to establish a higher education and research system. It comprises the public and private higher education institutions (notably Kuwait University and the Public Authority for Applied Education and Training [PAEET]) and research institutes (the Kuwait Institute for Scientific Research [KISR], as well as some Kuwait Foundation for the Advancement of Sciences centres, i.e. Dasman Diabetes Institute and the Jaber Al Ahmed Centre for Molecular Imaging and Nuclear Medicine).

#### 4.1. Main characteristics of an efficient higher education and research system

OECD analysis of research institutions in different countries and thematic areas has led to the identification of the main policy issues to help ensure that research contributes to innovation and social and economic development.

##### 4.1.1. Governance and strategy of higher education and research institutions

###### *Research and higher education institutions' missions*

The missions assigned to different types of higher education and research institutions by relevant legislation and public policy set the basic premises of what institutions are authorised, forbidden and expected to do, and underpins more detailed specifications of goals, profiles and responsibilities within individual institutions. These missions should be clearly set out, translated into the institution's strategic plan (including relevant indicators and key performance indicators) and aligned with the priorities defined at the national level and the vision of how research is expected to contribute to achieving these overarching goals (notably in national strategies).

###### *Institutional autonomy*

Higher education institutions (HEIs) and public research institutions (PRIs) in the OECD countries have a high degree of autonomy or discretion in the design and implementation of their activities. Recruitment, promotions, creation of internal structures such as technology transfer offices, legal entities and industry partnerships are decided by HEIs in a large number of cases. Only the level of salaries remains predominantly determined at the national level (Borowiecki and Paunov, 2018). Autonomy enables institutions to optimise their performance based on their local situation and knowledge, free from micro-management. In recent decades, governments across the OECD have tended to increase public institutions' operational and financial autonomy in matters such as institutional strategy, infrastructure and staffing. Even more, they have supported the development of institutions' strategic leadership through training programmes and dedicated funding to encourage strategic planning.<sup>1</sup>

##### 4.1.2. Funding of higher education and research institutions

*Government incentives and funding.* The incentives provided by government should drive institutions' activities at different levels (the institution as a whole, the faculties and departments, teams, and individual staff) towards achieving their objectives. Most countries use a combination of institutional funding for longer-term research and project funding. Institutional funding is distributed within institutions according to

specific modalities, depending on their internal strategy and the way this funding was allocated to them. An increasing number of countries (i.e. Australia, Norway, Spain, the United Kingdom) link institutional funding of research and HEIs to their performance (e.g. performance-based institutional funding, performance contracts, etc.), while still providing a stable funding base (funding based on size and history). Project funding is provided most often through competitive tenders by funding bodies of various types and forms, most often research agencies, as well as ministries themselves for more strategic and top-down projects. Non-governmental actors such as research charities and companies also provide project funding, to meet their own goals. The impact of this funding should be regularly evaluated.

The level and type of funding available to institutions to pay staff, provide buildings and equipment, and implement their activities should be commensurate with their objectives. In most OECD countries, a majority of higher education and research institutions are highly dependent on public funds, meaning that the level of government resources available and the mechanisms through which these resources are distributed in the system have a significant impact on institutional activities and behaviour.

### **4.1.3. Human resources**

*Internal structure of incentives.* The effectiveness of the higher education and public research system depends fundamentally on the staff who work in institutions and research units. Having well-trained, motivated staff is a pre-requisite for any effective system. This depends notably on the internal incentives in place in the different institutions. These include the allocation of financial resources among the different faculties, departments and teams, as well as career development mechanisms, human resource appraisal systems and some remuneration schemes (e.g. bonus for publications, patents or industrial contracts).

## **4.2. Higher education institutions**

The main HEIs performing research in Kuwait, in terms of the number of researchers and the amount of research they perform, are Kuwait University (KU), Kuwait Institute for Scientific Research (KISR), the Public Authority for Applied Education and Training (PAAET) and some 12 private universities.

### **4.2.1. Kuwait University**

KU was established in 1966, initially as a teaching university with 4 colleges, 418 students and 31 faculty members. It performed very little research until 1979, when research activities were added to its mission. By 2005-06, KU had grown to 14 colleges, and was comprised of 17 colleges in 2019, educating 36 704 undergraduate and graduate students with a total staff of 1 577 faculty members (Table 4.1).

**Table 4.1. Kuwait University's colleges, 1966 and 2019**

	1966	2019
Colleges	College of Science College of Arts College of Education College for Women	Allied Health Sciences Architecture Arts Business Administration Computing Science and Engineering Dentistry Education Engineering and Petroleum Law Life Sciences Medicine Pharmacy Public Health Science Sharia and Islamic Studies Social Sciences College of Graduate Studies
<b>Students</b>	<b>418</b>	<b>37 652</b>
<b>Faculty members</b>	<b>31</b>	<b>1 684</b>

Source: Kuwait University.

### *Kuwait University's overall performance*

Although rankings are in a number of ways problematic,<sup>2</sup> they provide a useful way to examine KU's performance compared to its peers globally and in the Gulf region across a number of performance criteria (teaching, research, knowledge transfer, industry income, and international outlook). KU does not appear in the Centre for World University Rankings or Shanghai rankings and is included in Times Higher Education University Ranking since 2017. The 2020 and 2019 Times Higher Education (THE) University Rankings placed KU in the range 801-1 000 (601-800 in 2017 and 2018) in the world, well behind King Abdulaziz University in Saudi Arabia (201-250) or Khalifa University in the United Arab Emirates (301-350 in 2019; 351-400 in 2020), but in front of Imam Abdulrahman Bin Faisal University in Saudi Arabia (1 001+ in 2019 and 601-800 in 2020). It ranks tied for 9th among the 15 Gulf country universities included in the THE world rankings. KU's ranking is particularly affected by its low research sub-score (research income, reputation survey, research productivity), citation sub-score and its relationships with industry (industry income). This ranking also provides a new ranking based on universities' performance against the United Nations' Sustainable Development Goals (SDGs). KU reached 84th (of a total of 456 universities), assessed based on their contribution to 4 SDGs.<sup>3</sup>

KU has engaged in significant efforts to improve its monitoring system. While the most recent monitoring report is from 2014/15, significant data were provided to the OECD review team as part of this study. This set of data allows to compare some of the intentions with apparent achievements and is suggestive of the conditions under which the university operates. Table 4.2 shows some of the strategic targets and their degree of fulfilment by the second half of 2019.

**Table 4.2. Kuwait University Strategy 2013-17: Comparison of selected targets for 2016/17 and achievements**

Targets	Achievements
Increase enrolment in labour-shortage subjects, especially STEM, so that 35% of its students would be graduating from scientific colleges in 2017, 35% from professional ones and 20% from humanities	22% of first-degree graduations in 2016/17 were in science, engineering and medicine; 54% in social sciences; and 24% in humanities.
Send at least 80% of scholarship students to the world's top 100 universities	Achieved
Achieve student-to-faculty ratios optimal for each college, in part by recruiting more faculty	The ministry's requirement for Kuwait University to enrol 2 000 extra students without allocating any extra budget has increased rather than optimised these ratios. The ratio of students to faculty is 24:1, which is much less favourable than in most leading universities.
Increase the number of postgraduate students by 30%	By 2017/18, a 15% increase had been achieved.
Introduce five new PhD programmes by 2016/17, in addition to the six already running (for a total of 11 programmes)	12 PhD programmes operating in 2018/19.
Increase scientific productivity by 10% per year	There has been a consistent decline in output since 2012-13 according to Kuwait University internal monitoring data which include almost exclusively publications from <i>funded</i> project. OECD analysis of Scopus data (covering all publications with a KU author) shows an increasing trend.
Be among the 500 best universities in the world for research by 2016/17	Kuwait University is not listed in the top 500 of any global university ranking.

Source: Data provided by Kuwait University.

The strategy also sets out a number of goals to improve efficiency and reduce bureaucracy. These are difficult to measure, but faculty complaints about these continue unabated. Interviews and internal KU documents reveal that the following factors hinder research performance:<sup>4</sup>

- difficulty in collaborating with internationally leading researchers and institutions;
- lack of incentives for academics to initiate new research projects;
- disincentive to seek external funding due to budget rules;
- inefficiency and lengthy lead times in the Purchasing Department;
- lengthy delays in securing approvals to recruit skilled workers and research assistants from abroad;
- inability to transfer research budget between financial years;
- too small budget allocated for research;
- item-based budgets allowing no flexibility and adequate programme planning and management;
- low rates of pay and short contract duration for people hired on research grants.

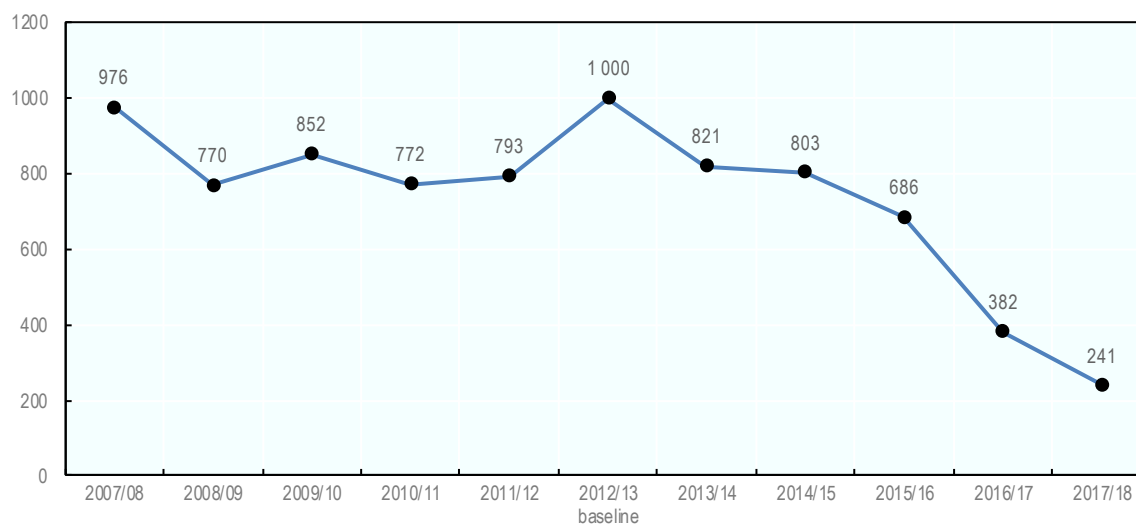
A thesis on academic freedom at KU in 2010 offers a similar list of complaints, based on a survey and interviews with KU academics, which tends to show that the situation has not improved (Ghareeb, 2010). This is confirmed by data from KU's internal monitoring system. The average duration of research procedures, which includes notably the crucial issue of equipment procurement, slightly improved from 2012-13 to 2014-15 (from 18.5 months to 16 months) before rising again each year up to 21 months in 2017-18.<sup>5</sup> This is consistent with information collected in interviews (not only at KU, but also in KISR) concerning the increase of the level of red tape and the pervasive pressure of budget audits.

### *KU's research performance*

The number of KU researchers' publications in 2017/18 is about a fourth of what it was in 2007/08 and 2012/13 (Figure 4.1). This is very far from the university target of a 10% increase per year. The proportion of faculty members with publications to total faculty has also regularly decreased in recent years, from 30% in 2012/13 to 21% in 2017/18,<sup>6</sup> compared to a university target of 40%. While the number of citations is

not formally part of the KU monitoring system, an indicator of research quality is provided by the number of publications in journals with different citation performance. The number of publications in Q1<sup>7</sup> publications, or the top 25% most-cited journals, has also decreased, from 200 in 2015/16 to 100 in 2017/18 (against a target of 209).

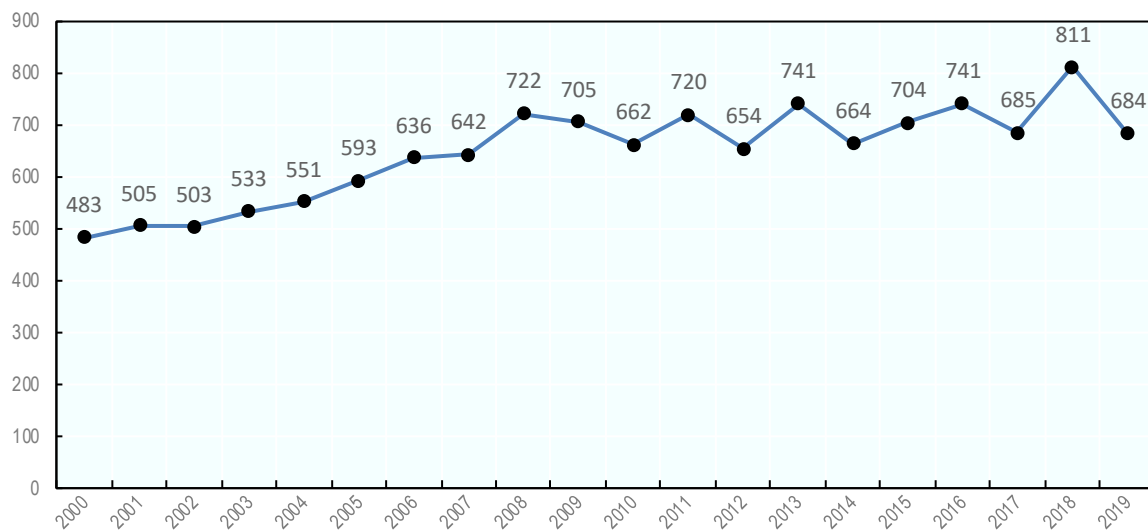
**Figure 4.1. Number of scientific research publications by Kuwait University staff, 2007/08-2017/18, based on KU monitoring data**



Source: Kuwait University website, Office of the Vice-President of Research, <http://www.ovpr.ku.edu.kw/index.php/en>.

As explained in Table 4.2, KU's own account of its publications mostly includes publications that originated from funded projects and therefore overlook most publications produced in a different institutional context. Only 241 publications are reported for 2017/18, while OECD analysis based on Scopus (which includes all publications regardless of the origin of the funds) puts that number at more than 800 (Figure 4.2).

**Figure 4.2. Number of scientific research publications by Kuwait University staff, 2000-19, based on the Scopus database**



Note: Only articles are included (i.e. conference papers, book chapters and notes are excluded).

Source: Scopus database, <https://www.scopus.com/search/form.uri?display=basic> (accessed on 11 January 2020).

Kuwaiti researchers co-operate with a diversified set of partners. At the end of the 2000s and today, KISR is a major research partner of KU, as shown in the co-publication data in Table 4.3. The medical faculty demonstrates good links to some national hospitals, directly or through the Ministry of Health. Two international private universities based in Kuwait have become significant partners (twice as frequently as PAEET).

**Table 4.3. Main Kuwait University co-publication partners, 2008-10 and 2017-19**

2008-10		2017-19	
Health Sciences Centre, Kuwait Faculty of Medicine	27%	Health Sciences Centre, Kuwait Faculty of Medicine	26%
Ministry of Health Kuwait (including hospitals)	10%	Ministry of Health Kuwait (including hospitals)	13%
Public Authority for Applied Education and Training Kuwait	3%	Cairo University	2%
Dasman Diabetes Institute	3%	Public Authority for Applied Education and Training Kuwait	2%
Cairo University	3%	Quaid-i-Azam University	1%
Universiti Kebangsaan Malaysia	2%		

Note: The Health Sciences Centre is part of Kuwait University.

Source: Scopus database, <https://www.scopus.com/search/form.uri?display=basic> (accessed on 11 January 2020).

The United States, the United Kingdom and Egypt have been the main partner countries since at least 2008 (Table 4.4). While the overall number of partnerships grew across the period from 1 606 to 3 298, most of the major partner countries were still significant in the later period. Pakistan, however, declined substantially as a partner while the People's Republic of China (hereafter "China") grew.

**Table 4.4. Kuwait University co-publication countries, 2008-10 and 2017-9**

2008-10		2017-19	
United States	19%	United States	15%
United Kingdom	8%	Egypt	8%
Egypt	7%	United Kingdom	7%
Canada	6%	Saudi Arabia	6%
India	4%	Canada	5%
Pakistan	4%	Iran	4%
Saudi Arabia	4%	Malaysia	4%
Australia	3%	Australia	4%
United Arab Emirates	3%	United Arab Emirates	4%
Iran	2%	Germany	3%
France	2%	Jordan	3%
Japan	2%	Italy	3%
Germany	2%	India	3%
Norway	1%	France	2%
Oman	1%	Brazil	2%
Italy	1%	Japan	2%
Netherlands	1%	Spain	2%
Finland	1%	China (People's Republic of)	2%

Source: Scopus database, <https://www.scopus.com/search/form.uri?display=basic> (accessed on 11 January 2020).

KU's research has not yet translated into significant innovation outputs, as measured by patents and disclosures (Table 4.5). Its intellectual patent office was created in 2005. KU's commercialisation activities only started in 2018, with negotiations initiated on one research project (phase change memory materials). As of 2019, three additional projects are in the commercialisation pipeline.

**Table 4.5. Kuwait University's innovation outputs**

Type of output	
No. of disclosures	93
No. of patents applied	8 (ongoing)
No. of patents obtained	49
No. of out licenses	–
Revenues	–

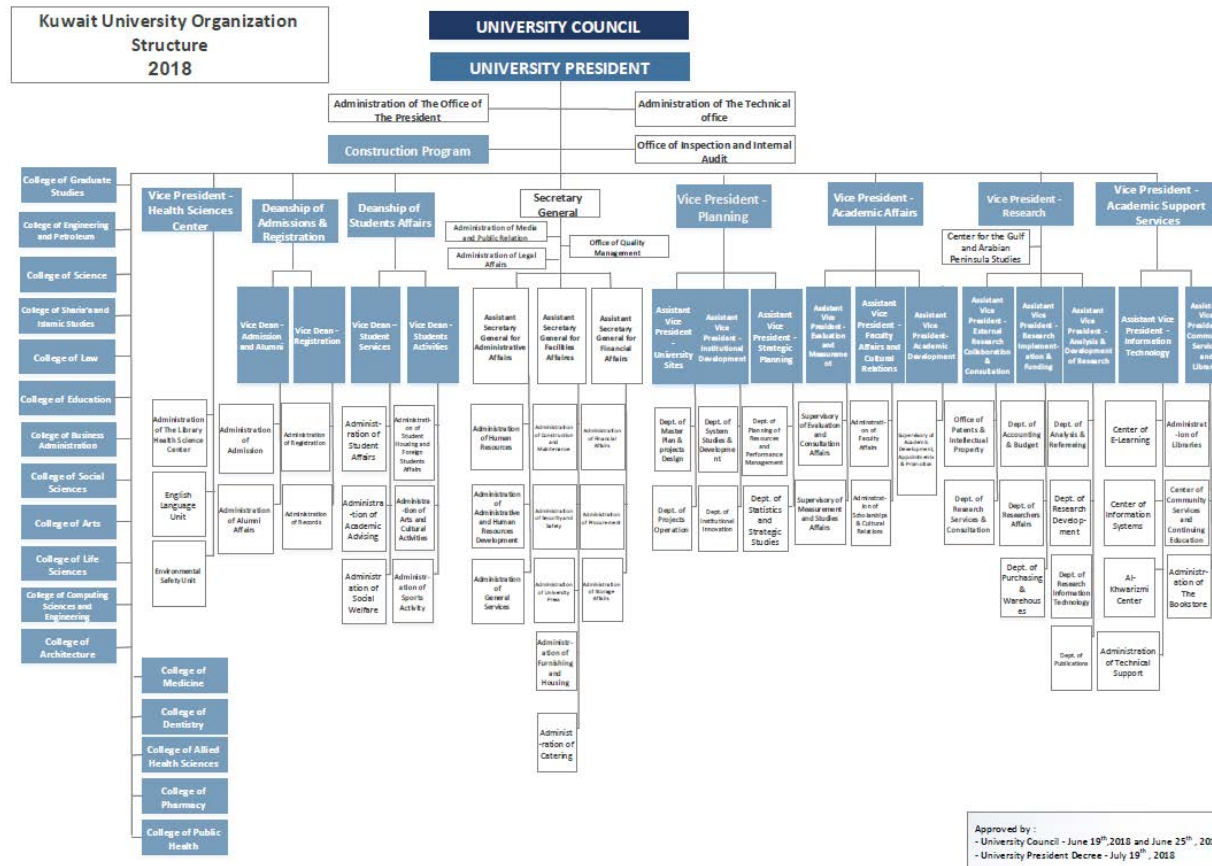
Source: Information provided by Kuwait University.

### *Governance*

KU is governed by a large council, chaired *ex officio* by the Minister of Higher Education (Figure 4.3). The under-secretaries from the education and higher education ministries are members as are three eminent Kuwaitis who represent the government sector; another three are from the private sector. Members include the university president and secretary general (both appointed by Amiri decree) as well as 17 deans of faculty. Funded research activities are managed by the Research Sector, headed by the Vice-President for Research. The Office of Patents and Intellectual Property Rights is placed under the supervision of the Assistant Vice-President Research for External Collaboration and Consultation.



Figure 4.3. Organisational chart of Kuwait University (2018)



Source: Kuwait University.

These arrangements allow for some societal influence on the university's overall direction, but which is reduced due to the power of colleges, where academics play a strong role. Over the past three decades or so, European universities have – at varying speeds and under different forms – been moving from collegiate governance to executive governance with societal representation. The board, with a majority of societal representatives, sets the institution's strategy and appoints the rector, while academic aspects of governance are left to the academics. In these universities, this shift in strategic power away from individual departments and colleges allows a “smarter” orientation and profiling of universities. This is crucial to allow universities to act strategically as integrated entities. The Netherlands is one country where ambitious reforms of the governance of universities have been implemented since the early 1970s (Box 4.1).

#### Box 4.1. Moving from collegiate governance to executive governance: The example of Dutch universities

Grounded in the idea that the Netherlands is a small country and therefore cannot excel at everything, prioritisation has been a constant in Dutch research policy.

Since the early 1970s, a series of reforms have gradually moved Dutch universities from a senate composed of professors responsible for the academic governance component and a board of curators for the administrative components to a new governance structure with strong leadership at the top level of the institutions.

The key elements of the new governance structure following a reform in 1997 are (World Bank, 2016):

- Establishment of a supervisory board with external members appointed by the government, which appoints the executive board and assumes a supervisory and control function, among others by approving institutional strategies, budgets and annual reports.
- Revision of the role of the executive board, which became the main decision-making and management body of universities.
- Revision of the role of the university council, which now has mostly an advisory role and consists exclusively of staff and student representatives.
- Strengthened position of deans or faculty boards as the most important decision-making instances on the faculty level (implying a mostly advisory role for the faculty councils). A study by the Rathenau Institute showed that deans play a key role to amend the faculty allocation model and research strategy in order to, notably, improve the faculty's strategic profile in order to attract outstanding researchers and/or develop new research fields (Koier et al., 2016).
- Replacement of the previous system of electing leaders by a system of appointments, ranging from the executive board, which is appointed by the supervisory board, down to the programme directors, which are appointed by the deans.

These changes were accompanied by enhanced autonomy for universities. The state decided in the 1980s to only use indirect steering mechanisms, i.e. mainly confining itself to the development of the broader framework conditions and granting greater latitude for self-steering to the universities.

Sources: World Bank (2016), International Trends and Good Practices in Higher Education Internal Funding and Governance, [https://www.che.de/wp-content/uploads/upload/LV\\_2nd\\_HEd\\_RAS\\_Ph1\\_Trends\\_and\\_Practices\\_20Dec16\\_post\\_review\\_final\\_2055.pdf](https://www.che.de/wp-content/uploads/upload/LV_2nd_HEd_RAS_Ph1_Trends_and_Practices_20Dec16_post_review_final_2055.pdf); Koier, E. et al. (2016), Spinning Plates: Funding Streams and Prioritisation in Dutch University Research, <https://www.rathenau.nl/en/knowledge-ecosystem/spinning-plates>.

## *Strategy*

KU's current Strategic Plan covers the period 2018-22. It consists of a short five-page document, presenting some generic objectives and goals:

- prepare a highly competitive graduate with leadership skills;
- produce high-quality research;
- offer high-quality training and consultation services;
- maintain highly-qualified and professional administrative and financial management.

This document was the result of significant internal and external consultations, notably through numerous workshops involving all KU colleges and centres, at all organisational levels, as well as external stakeholders.<sup>8</sup> These consultations were performed in order to develop the Strategic Plan but also, once finalised, to translate this plan into operational action plans for all of the university's operating units. The Office of the Vice President of Planning held numerous workshops in all colleges and working to deploy the Strategic Plan and help them prepare their respective Action Plans.

The Strategy is built around four main dimensions (quality, innovation, sustainability and global visibility). Each of them includes two to four goals, which are in turn decomposed in objectives and 'examples of initiatives'.

KU's strategy for 2013-17 (KU, 2015) was even more detailed, pointing to needs for improved performance on many dimensions and setting precise targets for each goal and objective. It covered all aspects of university operations, focusing on process improvements and better adapting the university's performance to societal needs.

The Strategic Plan is used deliberately as a generic call for initiatives: colleges and departments are invited to submit proposals of initiatives under the strategy's generic objectives and goals. Under each of the four main dimensions, KU monitors the list of proposed initiatives with dedicated KPIs. However, the strategy therefore includes no particular orientations beyond broad objectives that could help the strategic management in attempting to strengthen a specific institutional profile and support some priorities that could federate efforts beyond individual and dispersed initiatives. Interviews with the university tended to show that there is little ownership of the strategy throughout the university and that it is perceived to a large extent as a distinct process stemming from the Planning Sector, with only modest influence on the direction of research activities. One key issue hindering the strategic process – besides cultural issues – relates to the fact that it is not supported by additional funding prospects that would help the strategic profiling of the university, and initiatives have to be financed by the budgets of the different initiators. There is, therefore, little incentive to propose initiatives besides what the different parts of the university would have proposed in the absence of the strategy. In the research area specifically, the severe budget cuts that faculty had to endure and the significant increase of the administrative burden and delays have reduced the motivation to engage in ambitious actions. Based on the premises of its benefits, several governments have used different ways to promote institutional profiling, building on the strategic exercises of universities: excellence schemes, training of universities' strategic leadership, funding for projects in line with the university strategy and, last but not least, legal frameworks and rule setting (e.g. accreditation system, university governance rules, degree of autonomy of individual universities), performance-based funding schemes and performance contracts (Box 4.2).

#### Box 4.2. Lessons learnt on institutional profiling of universities and how to support it

A considerable literature has analysed the growing trend of diversification of higher education institutions, in particular since the 2010s. This trend is fuelled by heightened global competition for talent and funds, which requires universities to make themselves more visible on the international stage and distinguish themselves from competitors by developing a clearly differentiated strategic profile. The benefits are usually of two main types, whether it is considered at the level of individual institutions or at the level of the overall higher education landscape.

At the level of individual institutions, the profiling of universities consists in specialising in their core strengths, which, if successful and up to a certain level (hence avoiding overspecialisation), leads to an increase of their performance, as measured, for instance, in international rankings.

At the level of the overall higher education landscape, the specialisation of institutions is generally found to increase the overall dynamic efficiency of the sector, as it increases intra-organisational homogeneity and systemic diversity (although a direct causality is hard of course to establish and many studies are based on narratives rather than measurements). A diversified higher education landscape can reduce overlap and unnecessary competition, improve the average level of universities altogether, allow for more fruitful university co-operation, increase the local relevance of their activities and allow for better catering to the heterogeneous needs of stakeholders (including students, firms, administrations, etc.), offer more opportunities for social mobility (Huisman, 2017) (Huisman et al., 2015).

Although rather simple to understand in theory, it proves in many cases difficult to implement, since this trend towards strategic profiling can, at times, create internal tensions within institutions which have a long-established tradition of maintaining wide academic portfolios based on significant power from “autonomous” faculty staff. The bottom-up process that drives institutions’ decisions with regards to teaching and research areas automatically promote internal diversity, rather than a focus on key strengths. The pressure to focus on a limited number of specialist disciplines or research areas may therefore require a challenging balance of concerted efforts and strategic leadership.

Some universities have, for instance, embarked on strategic review exercises, defining a selection of areas to which most disciplines represented in the university can contribute. For instance, the Friedrich-Alexander University (Germany) dedicates internal funding to promote outstanding, preferably interdisciplinary, research projects at an early stage and in a flexible and non-bureaucratic way, in order to prepare them for external funding. This internal funding scheme for excellent research is expected to enhance the university’s reputation as a leading university, develop its unique selling points, improve its attractiveness as an employer for excellent researchers both from Germany and from abroad, and expand its strategic alliances with key partners. The university has created a matrix structure, composed of eight main research areas covering different academic fields, broken down into focus areas in each faculty. A process has been set up to keep this structure up to date, on the basis of various indicators used as proxies for the importance of a research area to the university (number of research-active staff in the area, third-party funding, scientific impact and international reputation) (Pruvot, Claeys-Kulik and Estermann, 2015). The strategic leadership of the University of Tromsø in Norway has set up a central university budget (financed, for instance, from vacancies and indirect costs of other projects) for funding specific flagship “structuring” projects (OECD, 2017). Other universities may provide seed funding to high-potential initiatives in order to help them reach a level where they can be turned into excellence scheme proposals.

The following good practices have been identified in reviews of university profiling (Hanover Research, 2013):

- strategic planning involves: formulating goals, objectives and action steps; and monitoring implementation, tracking progress and revising the plan, based on comprehensive institutional research
- linking strategic accomplishments to administrators' performance evaluations may also help to incentivise implementation
- involving stakeholders in the planning process can help build broad support among diverse constituents
- aligning the budget with the strategic plan helps increase the plan's impact
- the plan should answer the question: "How will we know if we reach this goal, and how will we prove it?"
- reporting annually on the institution's progress can sustain momentum after the plan has been approved.

Sources: Huisman, J. (2017), "Institutional diversity in higher education, institutional profiling", [https://dx.doi.org/10.1007/978-94-017-9553-1\\_32-1](https://dx.doi.org/10.1007/978-94-017-9553-1_32-1); Huisman, J. et al. (2015), "Measuring institutional diversity across higher education systems", <https://dx.doi.org/10.1093/reseval/rvv021>; Hanover Research (2013), *Strategic Planning in Higher Education: Best Practices and Benchmarking* [https://cdn2.hubspot.net/hubfs/3409306/Nurturing/Content%20Asset%20Downloads/Higher%20Education/Reports%20and%20Briefs/Strategic-Planning-in-Higher-Education-Best-Practices-and-Benchmarking.pdf?\\_hssc=12093739.1.1576501782319&\\_hstc=12093739.217f336c38d57](https://cdn2.hubspot.net/hubfs/3409306/Nurturing/Content%20Asset%20Downloads/Higher%20Education/Reports%20and%20Briefs/Strategic-Planning-in-Higher-Education-Best-Practices-and-Benchmarking.pdf?_hssc=12093739.1.1576501782319&_hstc=12093739.217f336c38d57). Pruvot, E.B., A.-L. Claeys-Kulik and T. Estermann (2015), *Designing Strategies for Efficient Funding of Universities in Europe*, <https://eua.eu/downloads/publications/designing%20strategies%20for%20efficient%20funding%20of%20universities%20in%20europe%20define.pdf>; OECD (2017), *OECD Reviews of Innovation Policy: Norway 2017*, <https://doi.org/10.1787/9789264277960-en>.

### *Funding*

KU's budget is negotiated directly with the Minister of Finance. Once agreed upon, it is then approved by the parliament. Figure 4.4 shows KU's operational and capital expenditures. Operational expenditures have grown since 2010/11, reflecting increases in student numbers. The university went through significant operational budget restrictions in 2015/16 and 2016/17, leading the university to reduce expenditures across the board (except basic staff costs). The main budget increases during the decade were related to capital expenditure, reflecting new construction activity, in particular the construction of the new Sabah Al-Salem campus since 2011/12.

According to available data, the operational budget per student decreased from roughly KWD 9 200 (20 000 students) in 2007/08 to about KWD 7 120 in 2015/16 (36 661 students). Since then, the budget has suffered further cuts while the number of students has remained stable (36 704 in 2018/19).<sup>9</sup>

Figure 4.4. Kuwait University's operational and capital expenditures, 2007-19

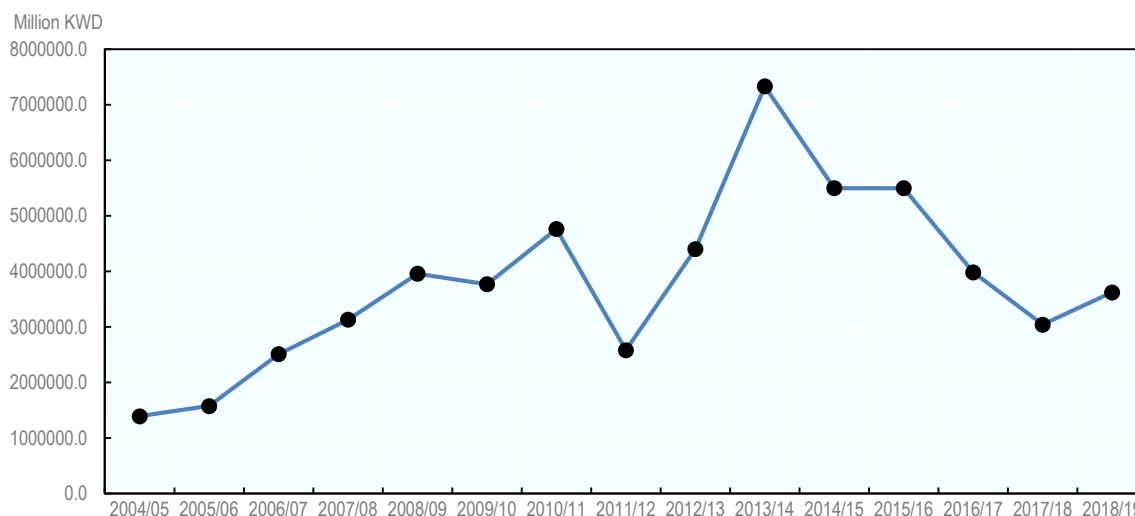


Source: Monitoring data provided by Kuwait University.

The research budget is based on a proposal prepared by the Research Sector and transmitted to the KU central administration, which integrates it in the total KU budget proposal submitted to the Ministry of Finance. According to information provided by KU, the Research Sector has consistently received budgets substantially less than requested. The budget cuts on the research budget were indeed extremely severe from 2013 to 2018 (Figure 4.5).<sup>10</sup> Even outside periods of budget restriction, the institutional research budget (not including staff costs) is still small and volatile.<sup>11</sup> It has tended to be 1-2% of the operational budget over the last decade, which might reflect that it is still not seen as a priority, not only by the Kuwaiti government, but also, as claimed by some faculty members, by the university council and leadership.<sup>12</sup>

As previously mentioned, these budget figures do not include staff costs. In the absence of monitoring the time spent on research activities, determining these costs requires making some assumptions. While faculty is expected to dedicate 30% of their time to research according to a university rule,<sup>13</sup> it is certainly less in reality, since not all faculty is “research active”. According to the KU monitoring system, 21% of faculty members had publications originating from funded research in 2017/18. However, using the 30% hypothesis, a rough estimate provides a staff cost for research of KWD 20.4 million.<sup>14</sup> Based on this estimate, the total research budget for 2017/18 is about KWD 24.4 million (including staff cost and external funding), hence about 10% of the university’s operational budget.

**Figure 4.5. Kuwait University’s research budget (not including faculty member costs), 2004-19**



Note: The research budget figures include costs of equipment, consumables and wages of the few temporary and permanent researchers (not faculty members).

Source: Monitoring data provided by Kuwait University.

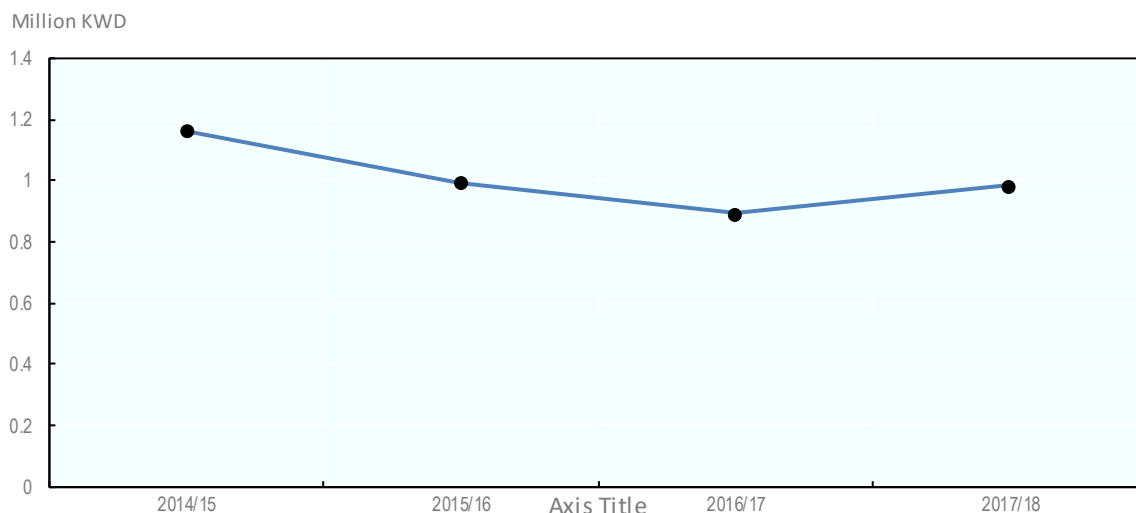
According to the Ministry of Finance, the budget fluctuations not only reflect budget restrictions imposed to KU, but also the fact that some planned expenditures under research budget lines were not realised in previous years. This low research budget execution can find its roots in both the limited research capacity of KU and the many bureaucratic restrictions (including regarding the item-based budget development and allocation) that hinder research activities. Regardless of the reasons, the effects of such drastic cuts were said to be devastating for staff motivation, and seem to persist even though the budget has somewhat recovered in the last two funding periods.

In addition to budget cuts, one critical hindering factor for KU – and other public institutions – is tighter control of the civil service commission and auditing services. This has resulted in a significant increase in monitoring and a reduction in autonomy. KU’s budget, which formerly had eight lines specified by the ministry, has now been restated in some 2 000 budget lines among which it is very hard to reallocate resources. As a result, as mentioned earlier, some of the budget goes unspent and has to be returned to the Ministry of Finance. This goes against the current trend of increasing autonomy and performance-based governance and funding of universities in many countries (OECD, 2018a). A recent OECD survey shows that HEIs enjoy a high degree of autonomy in recruitment, promotions, and the establishment of legal entities and partnerships (in excess of 85% of OECD countries). In 68% of OECD countries, public HEIs take their own decisions to allocate institutional block funding to teaching and research (OECD, 2018b).

KU is trying to implement a system of programme budgeting in order to rationalise budget execution and be able to monitor the achievements related to expenditures on different programmes. However, although laudable, it is unlikely that this endeavour could result in significant results if the initial budget allocation is increasingly itemised by expenditure line, rather than related to programmes and goals, and inflexible. As claimed during interviews, there are few linkages between the strategic steering of the university – in the hands of the university Council and the Planning Sector – and the budget allocation process managed by the Ministry of Finance.

In addition to the institutional funding allocated to the Research Sector as part of the university's total funding, researchers can receive external grants (mainly from domestic sources: KFAS, but also to a lesser extent from other organisations such as KISR, the Kuwait National Petroleum Company, the Kuwait Oil Company [KOC] and the Kuwait Petroleum Corporation). In recent years, the amount of external funds raised by KU researchers has remained around KWD 1 million (about USD 3.3 million) (Figure 4.6).

**Figure 4.6. Annual external contribution to research funding at Kuwait University, 2008-18**



Source: Monitoring data provided by Kuwait University.

Finally, a significant complication is that any contract research or grant income has to be deducted from the university's funding allocated by the Ministry of Finance, removing the economic incentive for the university to do such work. All staff efforts to secure external funding therefore result in extra work to implement the related projects, without funding to cover the additional costs. Moreover, given the limited budget and the lack of budget flexibility, there is almost no possibility to reallocate part of the "core" funding toward these new activities. This results in low levels of external funding. External funding still represents a significant proportion of the total research budget in recent years (about one-third in 2017/18), given the limited size of the total research budget. In the past, external funding originated almost exclusively from KFAS. A four-year partnership recently signed with the KOC will add about KWD 0.5 million per year.

As already mentioned, appropriate funding and steering mechanisms are prerequisites for high-performing, entrepreneurial and innovative universities. These mechanisms are increasingly linked in many countries by using performance agreements (or "contracts"). These have gained importance to reward the performance of HEIs and PRIs across the OECD (Box 4.3).

Box 4.3 presents some recent OECD trends and takes a closer look at the Austrian case. Another interesting case for Kuwait is Luxembourg, which instituted a comprehensive system of multiannual performance agreements to steer and fund its unique university (OECD, 2016b).



### Box 4.3. Performance agreements as mechanisms to link the steering and funding of universities: Results of an international survey and insights from Austria

#### OECD Database on STI governance (2018)

Performance agreements between institutions and their public authorities set performance targets and, in most cases, bind a share of their institutional funding allocation. Such agreements are in place in 13 OECD countries (7 of which have introduced them in the last decade) and at least 6 regions/federal states. There are significant differences across countries on a number of aspects of performance contracts, including the shares of higher education institutions' (HEI) budgets that are subject to performance contracts (from 1% in Denmark to 100% in Finland). Other differences relate to the targets they define and the way they do so. Targets are used to monitor the performance of HEIs and to assess whether their objectives have been met. While education and research targets are as expected the main criteria used in 11 of 11 countries with such information, 9 countries focus on HEIs' role in support of innovation performance, 4 address socio-economic challenges and 5 include targets to support to the local economy.

#### Performance agreements in Austria

In Austria, to steer public universities towards achieving the government's strategic objectives for tertiary education and research at universities, the Federal Ministry of Science, Research and Economics has three "cascading" instruments at its disposal: the University Development Plan; the development plans of each individual university; and the performance agreements.

The current Austrian University Development Plan (2019-24) presents eight systemic objectives providing a strategic framework for all universities to develop their individual development plans. Based on the individual development plans, performance agreements are negotiated on a three-year cycle between the ministry and each university. These agreements define a concrete set of measures and services based on the respective university's development plan, covering aspects of strategic and profile development, research and teaching, as well as other areas of university activities reflecting the so-called "third mission" of universities (i.e. societal engagement of universities, knowledge transfer and co-operation). They are the basis for the allocation as a lump sum of a large part (about 92% in 2018) of the public institutional funding to the universities. The achievement of the agreement's targets is monitored in frequent "performance dialogues" between the ministry and each individual university. The procedures and steps that need to be undertaken in cases where targets are not met are also laid down in the performance agreements (however, no real sanction mechanisms are foreseen, which has been criticised). Furthermore, universities report their activities and outputs in the form of annually updated indicators.

These performance agreements have been criticised, notably for their lack of impact on the strategic steering of Austrian universities. They, however, represent an interesting case where a productive dialogue on the future of each university is maintained with the funding authorities, allowing an essential learning process for both sides of the negotiation. Austria is currently starting its fifth round of performance agreement for the period 2019-21 and the agreements have significantly evolved since the first round started in 2007. When initiating such contractual arrangements, it is therefore critical to put in place adequate conditions for continuous forward-looking interactions between the different parties involved and regular assessment.

Sources: OECD (2018c), OECD Reviews of Innovation Policy: Austria 2018, <https://doi.org/10.1787/9789264309470-en>; AIT et al. (2017), "Background report OECD Review of Innovation Policies: Austria", mimeo; Borowiecki, M. and C. Paunov (Borowiecki and Paunov, 2018), "How is research policy across the OECD organised?: Insights from a new policy database", <https://doi.org/10.1787/235c9806-en>

### *Human resources*

The total staff of the university comprises 6 815 people, of whom only 23% (1 591) were academics in 2017/18. For comparison, the ratio of academic to non-academic staff in the UK university sector is close to 1:1.

As a result of the long-standing Kuwaitisation policy, a third of the staff and only a fifth of the faculty is non-Kuwaiti. However, as in many other sectors, expatriates represent 59% of technical staff and basically all handicraft workers. The role of the expatriate academics appears as capacity-building for a limited period of time, rather than driven by the need to strategically build long-term capabilities in the university's priority areas. This is very different from the practice in countries that are highly successful in research, such as Luxembourg, Sweden, Switzerland, the United Kingdom and the United States (Box 4.4), which encourage a high inflow of talented foreigners into tenure-track positions (or their equivalents) and usually make it possible for them to become citizens. In effect, these countries exploit a talent pool that is much bigger than the size of their country would suggest, and the bibliometric evidence is that this pays off. KU will need to follow suit if it wants to be competitive in global research.

A study on staff satisfaction carried out in early 2017 shows that the non-Kuwaitis that do find a position in Kuwait universities (business colleges only) are relatively satisfied in spite of the lower job security and that non-Kuwaitis are on average more satisfied with their jobs than Kuwaitis (Al-Mutairi, Naser and Al-Enezi, 2017). This result holds true for both state universities and private universities.<sup>15</sup>

#### **Box 4.4. Attracting foreign talents in Luxembourg**

As a small country with a relatively young research system with little visibility and reputation, the performance of Luxembourg's research system depends heavily on the calibre of the researchers it is able to attract from abroad.

Against this backdrop, the government has set specific schemes to attract the best international talents, durably establish them in the national higher education and research system, and maximise the knowledge spill-overs from these scientists. The Luxembourg National Research Fund (FNR) has two dedicated programmes to attract outstanding scientific talent to Luxembourg: PEARL and ATTRACT.

PEARL is designed to attract leading researchers not yet established in Luxembourg. Beneficiaries are offered a research grant for five years, which covers all aspects related to the development of a research programme, including major research equipment, infrastructure and data collection, as well as the necessary funding to set up a team. The programme selects, on average, one or two candidates a year (corresponding to EUR 3-4 million per beneficiary). During the period 2014-17, the FNR dedicated about EUR 25 million to this scheme. The recruiting research organisation is expected to allocate matching funds to the FNR grant. One important aspect is that the awarded financial contribution can be used flexibly to implement the research programme at the host institution in order to be successful in his/her research programme and build up his/her team. Another remarkable feature is that the supported researcher is accompanied by a Scientific Advisory Board that helps him/her steer the programme and report on the progress of the PEARL to the FNR.

The selection is performed in two stages. During the pre-proposal stage, a short list is done via a Strategic Merit Assessment by a dedicated PEARL standing panel. This assessment includes the applicant's fit to the respective institutional strategy, international relevance and long-term development of the field. The panel also assess the commitment of the host institution to the PEARL programme in terms of financial contributions and other forms of support (personnel, infrastructure or other additions to the project). This is considered by the FNR as key evidence that the supported position is truly part

of a long-term investment in a strategic area of development for the host institution. In the full-proposal stage, the applicants' proposals are assessed by at least three international experts in the field, followed by interviews with a scientific panel. Experts look at the candidate's scientific excellence, the scientific quality and innovativeness of the underpinning research programme, and its expected research impact. The impact is an additional way to look at the sustainability of this heavy investment, as it consists in an assessment of the potential to establish a productive and sustainable research group which will make significant contributions to the current knowledge in the field and in the training of the next generation of researchers.

ATTRACT is designed to attract young researchers to Luxembourg. It works in a similar manner to PEARL, but targets young researchers with two to eight years of professional experience since completing their PhD. The selection of proposals in ATTRACT is done in two stages, as for PEARL. The Strategic Merit Assessment pays particular attention to the contribution of the applicant's project to the development of a given priority area for Luxembourg. Selected candidates receive individual grants of EUR 1.5 million for starting investigators (postdoc and junior researcher level) or EUR 2 million for consolidating investigators (established researcher level) for five years). This significant amount enables the beneficiaries to set up their own research group in a domain of strategic relevance to the host institution. Here also, the sustainability of the position is a priority: the beneficiary, if successfully evaluated, can obtain a tenured position in Luxembourg after the grant ends. As for PEARL, ATTRACT applications must be submitted jointly by the hosting institution and the young researcher and require a strong and durable partnership.

Sources: OECD (2016), OECD Reviews of Innovation Policy: Luxembourg 2016, <https://doi.org/10.1787/9789264232297-en>; STIP-Compass database, <https://stip.oecd.org/stip.html>; FNR website, <https://www.fnr.lu/funding-instruments/pearl> and <https://www.fnr.lu/funding-instruments/attract>

The financial conditions at KU could help attract foreign academics, since salaries are internationally competitive (KWD 3 000 per month for an assistant professor and about KWD 5 000 for full professors, free of income tax). The working conditions are also attractive: academics have to teach a minimum of 3 courses, implying 6 contact hours per week or 192 contact hours over the 32-week academic year (compared with 12 contact hours per week for professor at PAAET and 18 contact hours per week and 550 hours in total per year in so-called "post-1992" universities in the United Kingdom).<sup>16</sup> KU academics who were granted a scholarship by KU also benefit from a year at each rank (including a year on full pay), at intervals of six years or more. A Scientific leave is also available to Kuwaiti and non-Kuwaiti faculty.<sup>17</sup>

KU uses conventional academic promotion criteria in addition to the other requirements: the staff member's contribution to teaching, research, and to university and community service. Promotion to a higher rank requires the production of articles in refereed journals (five for associate professor and ten for full professor).

Once promoted, there is no obligation for publishing or submitting a research project, but the university has recently established a set of financial incentives: KWD 1 000 (about USD 3 300) are provided to authors for publications in highly cited (Q1) journals. An incentive of up to KWD 4 000 (about USD 13 200) is awarded to researchers for each funded project when its results are published in a Q1 journal. Individual cash bonuses for high-tier publications have been introduced in China, Korea and Turkey, and while they have demonstrated its potential for boosting submissions to high-tier journals by about 46%, they did not result in any significant increase of actual publications in those journals, resulting notably in unnecessary overload of peer reviewers in those journals. Enhancing actual publications is much more effective through career advancement incentives (+34%) and institutional incentives (+21%) (Franzoni, Scellato and Stephan, 2011). Although no evidence could be collected on this as part of this review, some interviewees

mentioned some detrimental “non-merit based” practices regarding staff recruitment and promotion, notably favouritism based on social networks and interpersonal relationships. Such practices are not confined to KU but more pervasive in Kuwait. The aforementioned study on HEIs in Kuwait highlighted the role of *deawaniat*, i.e. weekly gatherings of social networks, in recruitment and advancements (Al-Mutairi, Naser and Al-Enezi, 2017).

KU’s student-to-staff ratio is at the unfavourable end of the range seen internationally, with one academic staff member for 24 students. Other universities in the region listed in the world rankings have rather fewer. Universities at the very top of the rankings (and which are very research-intensive) such as Oxford, Cambridge, UCL, Harvard and Princeton often have around ten students per staff member. Strong but less exalted and more teaching-orientated universities such as Manchester, Durham and many of the US state colleges may have a ratio of 15:1. The top 100 universities with the best student-to-staff ratio all have less than eight students per member of staff, including King Saud bin Abdulaziz University for Health Sciences and King Abdulaziz University (both in Saudi Arabia) as well as Khalifa University (United Arab Emirates) (THE World University Rankings, 2019).

### *Research activities*

The Kuwait Research Review Panel (KRRP) report provides a useful baseline for research at KU in 2005. It stressed that research was focused primarily in the Colleges of Science, Engineering and Medicine. It was fragmented and hampered by bureaucratic funding processes. University appointments were made based on teaching, not research, needs and doing research afforded faculty members few benefits. Teaching loads were said to be heavy and those engaged in research had to do so without any reduction in teaching. On the basis of this diagnostic, the KRRP made several recommendations to improve research and innovation performance. These include the development of a strategic plan for research; the improvement of linkages with other research-performing institutions in the GCC and beyond; the creation of centres of excellence for interdisciplinary work and teaching; an increase of internal and external research funding; the creation of incentives and the removal of barriers to faculty participation in research by reducing bureaucracy and teaching loads and employing more research assistants; the enhancement of collaboration with industry by setting-up outreach offices at departmental level. While several actions in line with these recommendations have been taken in recent years, results are still below expectations, and even worsening in certain critical aspects related to research.

Research activities are mainly performed by faculty members, as there are few PhD students, in particular in hard science (72 in 2018/19)<sup>18</sup>, and almost no post-doctoral researchers (between two and four during the period 2013-17). This is a problem because in most university systems, the PhD students and post-docs do the “foot-work” of research. Without them, it is difficult for permanent faculty members to be productive, especially in the “hard” sciences. The number of non-teaching researchers is also very low, less than ten for the entire university during the period 2013-17.

According to KU rules, academics should devote 40% of their time to teaching, 30% to research, and 30% to outreach and community service. Although it is hard to assess precisely, available statistics on the proportion of faculty members publishing or involved in research projects, supported by interviews at KU, tend to indicate that not all academics engage in research as much as they are formally expected to (i.e. below the 30% requirement). On average, about one-quarter of faculty members produce an indexed publication per year (21% in 2017/18) based on KU’s internal monitoring data.<sup>19</sup> These numbers are below what can be found, for instance, in terms of time dedicated to research (US faculty dedicated about 50% of their time to research in 2005) and proportion of faculty involved in research (between 45% and 97% of EU faculty are involved in research).<sup>20</sup> In Portugal, in 2015, 75% of teaching staff in public universities were formally integrated in a research team (OECD, 2019<sub>[127]</sub>).

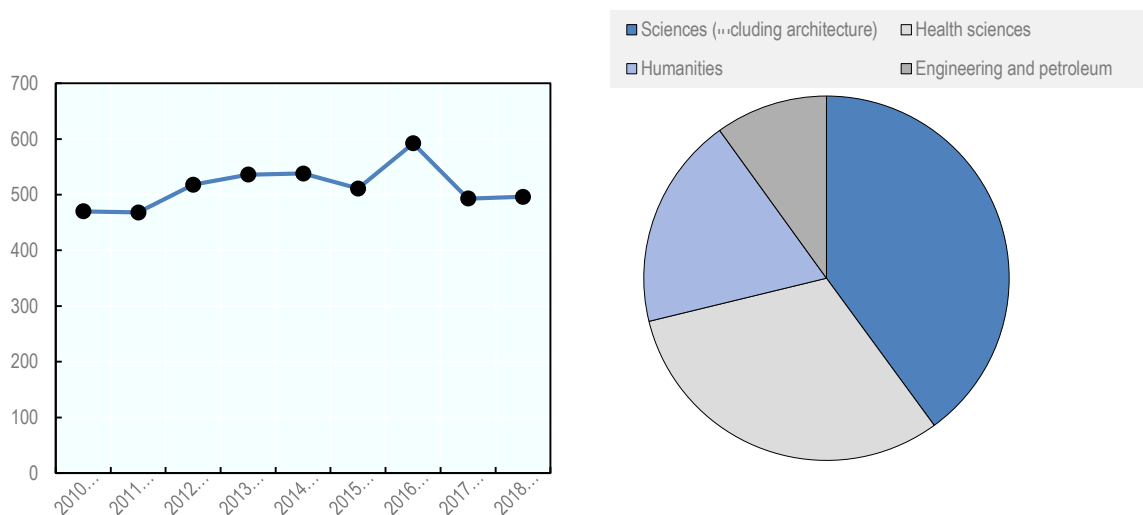
According to KU management, the involvement of faculty members in research has been hindered by the change in teaching load above 2 or 3 classes per term in 2010, with a financial reward that made the research funding financial grant less attractive.

The number of research projects is also indicative of the level of research activity at KU. All in all, there were 496 ongoing or completed, internally or externally funded, research projects in 2018/19. Most of them were in the science (37%) and health (29%) areas. It is particularly striking that the number of funded projects has been relatively stable since 2010, despite the budget volatility (Figure 4.7). This tends to indicate that the average budget of projects decreased due to the reduction of the overall research sector budget.

Most of these projects (416 projects, 84%, in 2018/19) receive funding from an internal grant scheme to which researchers can apply since 1985 (Figure 4.7). Other projects are funded externally (73 projects funded by KFAS alone). Proposals to the internal scheme are reviewed by one to three peers, depending on the size of the grant, the larger projects (above KWD 10 000) are reviewed by three external peers. However, most projects are small: of the 592 projects ongoing or completed in 2016/17, 60% had a budget of KWD 4 000 or less and only 33% had a cost of more than KWD 10 000 (KU, 2018). The largest projects are those that are awarded for research units and laboratories and projects jointly sponsored with KFAS, in the health area for the most part, as well as other specific projects related to KFAS programmes.<sup>21</sup>

About 130 grants are allocated per year, which indicates that most projects – even the small ones – last for several years and therefore the level of activities is low and spread over three to four years. The number of publications stemming from funded research is also modest. During the year 2018, the 493 projects (355 ongoing and 141 completed during the year) generated 127 publications, including 52 in Q1 journals and 36 in Q2 journals.<sup>22</sup>

**Figure 4.7. Number of research projects at Kuwait University, breakdown by themes, 2017-18 and per year 2010/11-2018/19**



Source: Kuwait University website, Office of the Vice-President of Research, [www.ovpr.ku.edu.kw/index.php/en](http://www.ovpr.ku.edu.kw/index.php/en).

### *Higher education activities*

KU had 38 526 registered students in 2017/18, having graduated 7 435 the year before. Some 94% are undergraduates and 6% are enrolled in a Master's degree. Of the 2 239 graduate students, 72 are working on PhDs (Table 4.6).

**Table 4.6. Students enrolled at Kuwait University by discipline and degree, 2017/18**

Discipline	Bachelor's		Master's		PhD	Percentage of total student population
Natural sciences	3 999	11%	200	9%	5	7%
Engineering and technology	4 813	13%	428	20%	0	0%
Medical and health sciences	2 165	6%	63	3%	19	26%
Social sciences	14 357	40%	856	40%	0	0%
Humanities	10 953	30%	399	18%	48	67%
Others (joint disciplines)	0	0%	221	10%	0	0%
Total	36 287	100%	2 167	100%	72	100%
Percentage of total student population	94%		6%		0.2%	

Note: The number of PhD students only include those registered at KU graduate College (hence excluding those registered at PAEET or KISR scholarship programs).

Source: Data provided by Kuwait University.

According to data provided by KU, most Kuwaiti PhDs (445 in 2017) at KU are hosted in foreign institutions, mainly in the United States (285) and in the United Kingdom (72).<sup>23</sup> This is a condition for being able to find a position at KU on their return to Kuwait. For comparison, some 4.3% of the UK student population is doing a PhD in 2017/18.<sup>24</sup> This compares with 0.2% at KU. Even when adding KU's PhDs hosted abroad, the ratio is only 1.3%. In the absence of precise statistics, we can estimate the number of doctoral graduates at 80-100 annually,<sup>25</sup> or about 0.07-0.09% of the relevant age cohort. This places Kuwait among the countries with the least doctoral graduates, well below the OECD average (1.6%). Some other PhDs hosted by PAEET and KISR are not included in the calculation but their number is not large enough to significantly change this assessment.

Roughly 85% of the students are Kuwaitis. KU has a 15% maximum for non-Kuwaiti enrolments at first-level university degrees, but accepts a higher proportion of non-Kuwaitis for post-graduate degrees.

KU has two semesters per year, starting in September and January, each of 15-17 weeks duration. Optional summer courses are provided during an additional eight-week period (similar to that at mainstream US and UK universities, but leading universities such as Oxford and Cambridge have a 24-week year). Class sizes are said to have grown in many cases to exceed agreed limits, as a result of a decision by the ministry to increase student numbers by 2 000 without increasing faculty numbers.

KU's teaching activities are dominated by the social sciences and humanities (70% of students). In line with the prominence of social science and humanity studies in the university, the 6 905 students graduated have mainly found positions in law, administration, education and social services: 540 were hired as lawyers, 583 as social scientists, 2 017 as educators, 634 as administrators, and 1 049 as *sharia* and Islamic experts. Of graduates, 834 became engineers; 150 doctors, pharmacists and dentists; 210 health life sciences personnel; and 236 scientists (KU, 2018).

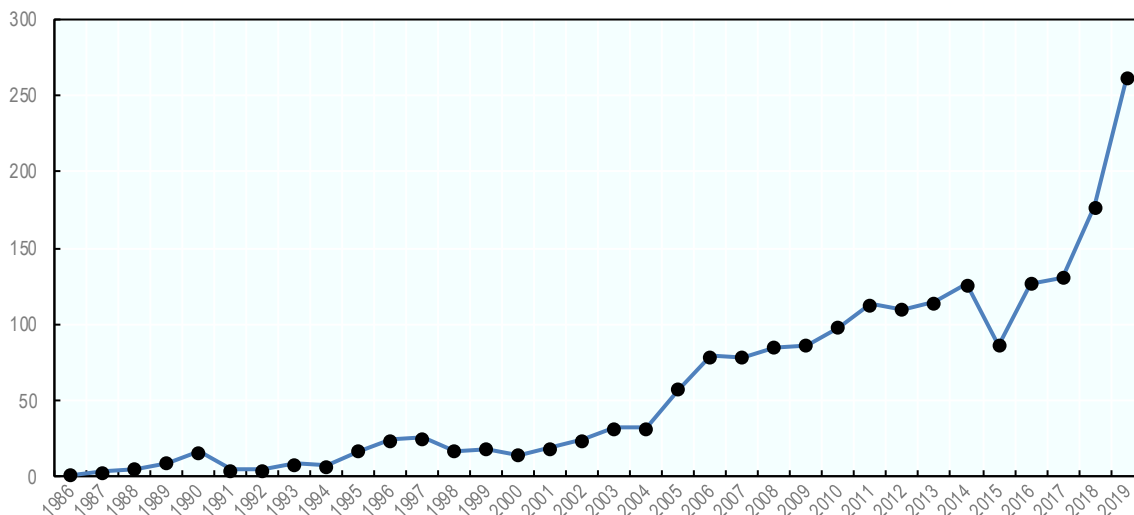
#### **4.2.2. The Public Authority for Applied Education and Training (PAAET)**

The PAAET is the equivalent of what would be called a "technical university" or "polytechnic" in many countries having a dual higher education system. It was set up in 1982 to provide a three-year undergraduate applied education (associate and bachelor degrees, for instance in nursing) and shorter vocational training courses. It aims to educate and train the national workforce in order to endogenously promote the skill-based development of the country. One key objective, reiterated in several documents, is to "rebalance the national labour market": given the dominance of expatriate labour in the private sector, PAEET was established to train Kuwaitis to be able to take over some of their roles.

### PAEET's research performance

Little information is available on PAEET's research outputs. Figure 4.8 shows that PAAET effectively began to publish in the scientific literature in the early 2000s, with its production recently starting to exceed 100 publications per year.

**Figure 4.8. PAAET publications in Scopus per year, 1986-2018**



Source: Scopus database, <https://www.scopus.com/search/form.uri?display=basic> (accessed on 10 January 2020).

PAAET's scientific publications focus on mainstream "hard" sciences and engineering (engineering alone accounts for about 18% of publications). In many subjects, the rate of output has not changed much over time. However, it has declined significantly in environment, chemistry and nursing while increasing substantially in physics, computer and social sciences.

PAAET's international co-publications are less US-focused than those of KU. The main partners during the period 2017-19 were Iran, Saudi Arabia, China, Viet Nam and Australia. In the period since 2008/10, Oman has declined in importance to be a very small partner, while Saudi Arabia, Malaysia and Pakistan have become much more important than before.

### Governance, strategy and funding

PAEET is headed by a director general and governed by a board of directors. The board of directors:<sup>26</sup>

- develops plans and programmes of applied education and training and follows up on their implementation;
- proposes draft laws and decrees related to its competence;
- establishes, abolishes or merges applied education institutes and training centres;
- sets the conditions for admission to these institutes and centres and the system and programmes of study and duration, scientific degrees and certificates granted, and the adoption of the results of final exams;
- determines the financial rewards that may be granted to learners and trainees in these institutes and centres and the conditions for obtaining them;
- sets financial and administrative regulations, appointment and promotion provisions, and salary systems within the Civil Service Law;

- approves the draft budget and final account before submitting it to the competent authorities;
- decides on scholarships and study leave for the authority's staff, students and trainees in its institutes and centres;
- interacts with public authorities and other institutions to identify the needs of the labour market while maintaining its autonomy in terms of the provision of education and training.

PAEET's budget amounted to KWD 302.8 million in 2017/18. Total expenditures were KWD 280.2 million.

The total approved budget for ongoing research projects was KWD 747 000, technological studies and basic education colleges accounting for about 75% of the research carried out. KFAS financed ten of these projects, accounting for 24% of the approved budget (KWD 181 000) (PAEET, 2019a). Total research expenditures in 2018/19 amounted to KWD 152 810, of which KWD 42 778 was funded by KFAS (PAEET, 2019b). According to these figures, research accounts for about 0.06% of PAEET's total annual expenditures.

### *Higher education activities*

In 2007, the PAAET was comprised of six colleges of applied education and eight training institutes (Table 4.7).

The PAAET had about 50 000 students in 2017/18, including about a fifth in the training institutes. It runs four main educational colleges and eight training institutes.<sup>27</sup> Its colleges offer three-year diplomas and teaching certificates while the training provided by the training institutes tends to be of shorter duration. The PAAET also provides custom short courses for various ministries or large state-owned companies like the KOC. Almost all students are Kuwaitis and only a few scholarships are awarded to non-Kuwaitis.

**Table 4.7. PAEET student enrolment 2017/18**

Sector	College and training institutes	Number of students and trainees	%
Applied education and research sector	Faculty of Basic Education	22 395	57%
	Faculty of Business Studies	8 556	22%
	College of Technological Studies	6 108	16%
	Faculty of Health Sciences	1 488	4%
	College of Nursing	609	2%
<i>Total applied education and research sector</i>		39 156	100%
Training sector	Higher Institute of Communications and Navigation	1 500	13%
	Higher Institute of Energy	920	8%
	Industrial Training Institute – Shuwaikh	1 065	9%
	Industrial Training Institute – Sabah Al-Salem	953	8%
	Nursing Institute	736	7%
	Construction Training Institute	1 099	10%
	Vocational Training Institute	509	5%
	Higher Institute for Administrative Services	3 201	28%
	Institute of Tourism, Beauty and Fashion	14	0%
	Introductory training courses	653	6%
	Special courses average	659	6%
<i>Total training sector</i>		11 309	100%
<b>Total</b>		<b>50 465</b>	

Source: Information provided by PAEET.

There is no PAAET-wide strategy for knowledge development and the connection to Kuwait's development strategy is disaggregated. Each college and institute is expected to research the requirements of the



relevant job markets (assisted by industry advisory committees) and adjust the number and type of places they provide accordingly. This, or a lack of student demand, means that some courses may be suspended periodically. The most formal channel between PAEET's provision of higher education services and national priorities consists of its participation in the newly established Higher Committee on Labour Market under the aegis of the General Secretariat of the Supreme Council for Planning and Development (SCPD).

There is no relevant skill or qualification framework to structure PAEET's provision of education and training. The national qualification framework dates back to 2003 and has not been updated since then, despite major changes of job market requirements, in relation to the digital revolution, for instance. New national skills standards were developed in 2017, but are not yet being implemented.

While the number of trainees in institutes has been somewhat stable in recent years, the number of students is growing, from 35 434 in 2014/15 to 39 156 in 2017/18. PAEET faces the double challenge of having to accept all graduated students – sometimes as a “higher education institution of last resort” – while having difficulties to attract national students in some key areas such as nursing. More generally, PAEET is impeded in its mission to provide a national workforce for the private sector since most students opt for the privileged conditions of a job in the government sector, to which they are legally entitled. In a sector like construction, for instance, only about 7% of students went for a job outside the government sector. In order to at least partially offset this unbalanced labour market, PAEET provides incentives (“specialisation” and “excellence” bonuses) to students who accept to join certain disciplines where new competencies are most needed. In 2017/18, 6 119 students and trainees received a “specialisation” bonus and 2 876 an “excellence” bonus.

### *Staff*

PAEET had 4 658 staff in 2017/18, including 373 non-Kuwaitis and 4 285 Kuwaitis. There were 3 003 teaching or training staff and 1 655 administrative staff. Among the 1 527 teaching staff, 316 were professors or co-professors and 1 211 assistant professors, lecturers or teachers. There were 1 476 trainers. Of the total staff, 2 542 fell under the “special cadre” status and 2 116 were “general staff”.<sup>28</sup>

PAEET's staff is well qualified, with 39% holding a PhD. The PhD-holders were strongly concentrated in basic education (61%), with other colleges having 25% or fewer PhDs (KRRP, 2007).

PAEET's staff-to-student ratio is similar to that of KU, with about 26 students per academic staff member. As expected, this ratio is far lower in institutes, with a ratio of staff-to-trainees around 8.

### *Research activities*

Initially, the PAAET was not mandated to do research, but by the time of the KRRP report, it was doing some research in order to develop staff capabilities and support scientific innovation (KRRP, 2007). Research at PAEET remains a secondary and informal mission, not mentioned in PAEET Law. However, in practice, it is becoming more prominent. The institution has established new processes, such as, for instance, financial incentives for publications and research-based promotion mechanisms. Publication has become one of the criteria for promotion within the PAAET and financial incentives are offered to authors who publish in impact-factor journals.

PAAET research projects may be done either with internal or with KFAS external funding (though the institutional funding budget is only of the order of KWD 100 000). In both cases, applications are processed by a research office in the central administration. The Environmental Protection Agency and KFAS are its main external research funders.

In 2007, PAEET was engaged in about 230 research projects, about half of which were funded internally (47%), with the balance almost equally divided between the Environmental Protection Agency and KFAS. These projects were small (in the range of KWD 5 000-8 000 per project) and took a long time to complete.

In 2018/19, PAEET reported 128 projects, 27 of which were completed during the year. As for KU, a dedicated commission selects the projects to be internally funded (PAEET, 2019b).

Publication data (doubling the number of publications per year between 2007 and 2017) and interviews suggest that research activities have increased significantly in the last ten years, but there are no comprehensive and recent data available.

Instructors are expected to provide up to 12 hours of teaching per week. They can apply for up to an additional four hours of teaching in return for increased pay. However, there is no reduction in teaching hours or increase in pay provided to those who do research in addition to teaching.

The PAAET's vocational courses operate against the background of a national qualifications framework developed in 2003. This was updated into a new set of National Skills Standards in 2016, but according to the PAAET, this has not been implemented.

### **4.2.3. Private universities**

Reflection on the establishment of private universities in Kuwait started mainly in the second half of the 1990s. These institutions were seen as serving different needs that were becoming more pressing: responding in a cost-effective manner to the growing number of students entering higher education, in line with the willingness to support the knowledge-based development of the country; the provision of vocational education that would help reduce the number of Kuwaiti students studying abroad. According to Al-Saadi (2015), one early motivation was to also to open avenues for education of the children of expatriate workers. More generally, the overall aim of private universities has evolved since they were first allowed to operate in Kuwait, from a purely quantitative to a more qualitative role: while they were simply expected to add capacity to the higher education system, they are now valued for opening the range of educational options to students, teaching and training specialties that are not offered by KU or PAEET, and opening new channels for interaction with foreign university partners.

#### *Governance, strategy and funding*

The private university and college sector is regulated by the Private Universities Council of Kuwait (PUC), created in 2000. The PUC is headed by the Minister of Higher Education and has eight members. It accredits universities and new courses, approves the appointment of new academics, approves fee levels set by the universities and monitors the quality of activities performed by universities, using international quality assurance and accreditation standards.

Private universities are funded by their private partners and tuition fees. They are also partly and indirectly funded, since the PUC provides internal scholarships for students to about 4 000 students annually.

The PUC also serves as a liaison between the government and the private institutions in order to better orientate private universities towards the national needs and priorities. However, the PUC receives little guidance from the SCPD as to where to develop future capacity and is left to determine, together with the private universities, what the future needs of the labour market will be.

#### *Higher education activities*

The sector is young and fragmented into many, mostly small, organisations. The more important ones are foreign. These institutions fall clearly into two groups:

- Universities offering bachelor's degree courses (none offers a higher degree). These implicitly compete with KU.
- Colleges providing two-year diplomas and shorter training courses. These implicitly compete with the PAAET.

The total number of students enrolled in private universities was about 25 000 in 2019 (about 10 000 in 2006/07). Table 4.8 provides an overview of the private universities' landscape.

**Table 4.8. Foreign and private universities and colleges in Kuwait**

Name	Year established	Faculty	Students	Observations
<b>Bachelor degree level universities</b>				
American University of the Middle East	2008	10 415	8,000	Partner: Purdue
American University of Kuwait	2003	85 in 2011	1 260 in 2010/11	Locally owned, for-profit liberal arts institution Partner: Dartmouth College in Hanover, New Hampshire
Arab Open University	2001			Based on UK OU
Australian College of Kuwait <sup>1</sup>	2002	163	3 098 <sup>1</sup>	ACK offers Diploma and Bachelor degrees that are endorsed by its Strategic Partner CQUniversity Australia
Gulf University of Science and Technology	2002	160	3 700	Partners: University of Missouri and University of Calgary
Kuwait College of Science and Technology	2015	51		Start-up phase
Kuwait International Law School	2009	40		
<b>Diploma level colleges</b>				
Algonquin College Kuwait <sup>1</sup>	2015	15	217	Diplomas
American University of Kuwait <sup>1</sup>	2013	114	2 500	Sub-degree courses
American College of the Middle East	2009			Two-year diplomas
Box-Hill College Kuwait	2007			Women only. Two-year diplomas Branch of Box Hill College in Melbourne
College of Aviation Technology	2009			Two-year diplomas – aircraft maintenance
Kuwait Technical College	2014			Two-year and industry IT diplomas
Kuwait Maastricht Business School	2003			MBA, DBA degree Branch of Maastricht School of Business in the Netherlands

1. Information provided by the college/university.

Sources: (KFAS, 2017a); websites of the universities.

Most private universities are governed by a board of trustees comprised of both local and international members representing higher education and corporate industries.<sup>29</sup>

The government has encouraged the establishment of foreign universities by providing land, supporting the development of their infrastructure and providing scholarships to students. However, the highest status international universities do not set up in Kuwait, but elsewhere in the Gulf. A large proportion of the students attend thanks to scholarships from the Kuwaiti government (in the case of the American University, this is about half the students). These universities tend to focus on a small number of subjects – especially ICT and computing. Many offer a foundation year, intended to close the gap between the attainment levels typical of Kuwaiti schools and entrance needs for university.

The majority of the teachers in the foreign universities and colleges are expatriates, typically on fairly short (two- to three-year) contracts because of uncertainties about whether the government will continue funding the student scholarships. Expatriates also risk deportation if complaints are made against them. There is no tenure track. In principle, the universities and colleges could offer longer-term contracts, but there is uncertainty about whether the government will continue to provide the scholarships on which a large part of their market depends.

### Research activities

At present, these institutions provide marginal capacity to the domestic Kuwaiti higher education system, particularly in business and IT-related subjects, and have a limited – but growing – research capacity.

While most of these universities are still only developing their research agenda and pilot infrastructure (Al-Saadi, 2015), some of them have developed their research capacity and made significant efforts to develop and integrate research with their teaching activities. Although, as for KU, these universities have no non-teaching researchers, most faculty members hold a PhD in some of them (for instance, 84% of the 114 faculty members at the American University of Kuwait have a PhD).

A growing number of these universities are doing some research, and those which do are able to receive KFAS research grants in competition with Kuwaiti organisations such as KISR and KU. KCST for instance, although only created in 2015, already has a significant track record. It submitted 59 applications to KFAS, of which 21 were selected for funding. It also carried out 33 externally funded research projects.

The joint undertaking of research projects – along with other forms of collaboration and exchange – is part of the requirements that the PUC has established for the accreditation of private universities. A research and development committee at the PUC oversees the development of these activities. While modest and concentrated in only a few of them, the number of publications from these private institutions reveals that some of them are active in research (see Table 4.9).

**Table 4.9. Number of publications of research-active private universities and colleges in Kuwait, 2010-18**

Name	Number of publications
American University of the Middle East	636
Gulf University of Science and Technology	595
American University of Kuwait	324
Australian College of Kuwait	277
Kuwait College of Science and Technology <sup>1</sup>	193
Arab Open University	153

1. Since 2016 only.

Sources: Scopus.

Those that are the most active in research have developed processes (including some still-minimal internal and external funding capacity) and infrastructure to promote their research activities. For instance, the American University of the Middle East (AUM) has developed a research centre (AUM Research) focused on providing opportunities for students and faculty to engage in research, and to further and encourage critical thinking and problem-based learning. ACK also established a research centre in 2016 to act as a hub where all research-related activities will be managed and supervised. Also, ACK has established relevant policies and procedures, research fund, and research incentives to foster research among ACK faculty members. It has also very recently established a Nanotechnology Research Centre, with the support of Purdue University (United States). The Gulf University for Science and Technology has a dedicated research and development office to facilitate research activities within the university and a University Research Foundation to help faculty undertake pilot projects for exploratory research projects. It provides funding and/or matches the costs associated with external funds obtained. The Australian College of Kuwait also undertakes a variety of research activities, with international, as well as national, partners such as KISR and KFAS (Box 4.5);

#### Box 4.5. The Australian College of Kuwait

The Australian College of Kuwait (ACK) was established in 2004 with the mission “*to deliver quality higher education and training, both theoretical and experiential, in engineering and business through a learning environment that is respectful, supportive and safe, in which innovation and lifelong learning by students are fostered*”.

In 2019/20, 3 098 students were registered at the ACK. The college has 74 faculty members (most of them being non-Kuwaitis). 19 of them are professors or associate professors; 55 are assistant professors. All full, associate or assistant professors hold a PhD.

The board of trustees is its highest authority, setting its general policies and controlling their execution, including the supervision of its academic and research works as well as other matters related to its activities. The college has expanded and formalised its research activity in recent years. It has established a Research Fund (to fund internal research project), a Scientific Research Council in 2016 (to oversee, organise and promote research and research-related activities), a forum for faculty to submit individual and joint research proposals for funding and support, and formed a joint Research Committee with Central Queensland University (35 000 students in Australia) for research collaboration and capacity building (a number of shared projects are ongoing). It also has a Research Policy and a Research Strategy Plan. Its research is, for the most part, of applied nature and conducted in close interaction with the ACK’s Industrial Advisory Board in order to support faculty members to develop research projects in co-operation with industry.

In line with these developments, the college has increased its budget dedicated to scientific research and related staff development in recent years. Furthermore, the ACK is closely collaborating with the PUC for the establishment of a Kuwait-based scientific journal. The ACK signed a memorandum of understanding for research collaboration in 2017 with KISR, and a co-operation agreement for data sharing with KFAS in 2018.

During the year 2017/18, 108 project applications were developed: 7 joint research proposals with Central Queensland University; 29 internal research grant applications and 72 KFAS research grant applications.

Of the 33 faculty recruited in 2016/17, 58% held a PhD. Promotion criteria for assistant, associate and full professor ranks include research-related achievements, in particular, evidence of high-quality, peer-reviewed research publications, and significant research grant funding and/or awards.

In 2016/17, ACK faculty published 68 articles, 46 of which were in Q1-Q4 journals (28 in Q1 journals). Since 2010, the number of publications amount to 222 papers (28 in Q1 journals).

The college also has a number of initiatives to support innovation and entrepreneurship, such as boot camps, a New Product Launch Competition, a Competition for Innovation and Entrepreneurship in SMEs and, of course, a number of entrepreneurship and problem-based learning courses and events.

Sources: ACK (2018b), Faculty Research Output 2016/2017; ACK (2018a), ACK Annual Report for the Academic Year (2016/2017); ACK human resource information provided by the ACK.

### 4.3. Research institutes

#### 4.3.1. The Kuwait Institute for Scientific Research

The Kuwait Institute for Scientific Research (KISR) was established in 1967 by the Arabian Oil Company Limited (Japan) in fulfilment of its obligations under an oil concession agreement with the government of Kuwait. The institute was established to carry out applied scientific research in three fields: petroleum, desert agriculture and marine biology. It has since then expanded and grown mainly in response to demands from various public authorities in charge of other areas. For many years, KISR was the only research-performing institution in Kuwait, and it is still the largest.

##### *KISR's overall performance*

An external evaluation of KISR's Fourth Strategic Programme (1995-2000) stated that while research quality was adequate in most parts of the organisation (and strong in a few), international linkages were inadequate. Productivity and morale were low. Parts of the organisation were critically dependent upon expatriate skills and the Kuwaitisation process put these areas at risk. Project management was assessed as generally insufficient. Sales and marketing were bureaucratic and failing to adequately engage with customers, especially in the private sector, or to provide timely proposals or results. Low levels of absorptive capacity and budget for research were major obstacles among both public and private sector customers. The lack of an overall STI policy hampered KISR's efforts to devise its own strategy and maintain a division of labour with others doing research in Kuwait (Arnold et al., 1999).

While acknowledging the value of many of the technical areas and projects on which KISR worked, the KRRP (KRRP, 2007) also offered strong criticisms of KISR in 2007, pointing to:

- ambiguity in strategic direction and measurable performance objectives;
- lack of experienced and dynamic managerial leadership;
- lack of high-performance management systems;
- inadequate staff management, exacerbated by the process of Kuwaitisation that tended to deprive KISR of expertise and meant a complete absence of non-Kuwaitis in leadership positions;
- lack of competitiveness in regional and world markets;
- inadequate ministry oversight, so that KISR effectively determined its own agenda, independently of government.

The report pointedly set out recruitment criteria for future directors- and deputy directors-general based on quality and experience, saying that non-Kuwaiti as well as Kuwaiti candidates should be considered.

No evaluation or review of KISR in recent years provides an updated overview of KISR's current performance. The interviews performed with KISR and its main partners as part of this OECD review tend to show that despite significant internal reforms and an increase of the scale and scope of research activities, some of the issues listed above are still hindering KISR's ability to deliver on its mission, in particular with regards to research commercialisation. Most of the recent data originating from the institute's monitoring system support this claim. The number of publications has remained stable in recent years (as accounted for in the institute's monitoring system), the numbers of research projects (and contracted projects) have increased significantly. However, the number of patents granted remains limited (eight in 2017/18 and 2016/17), although it has increased in recent years. Hence, despite significant efforts, there has not been any major improvement in the field of research commercialisation in recent years, partly due to the fact that KISR still operates in a challenging environment.

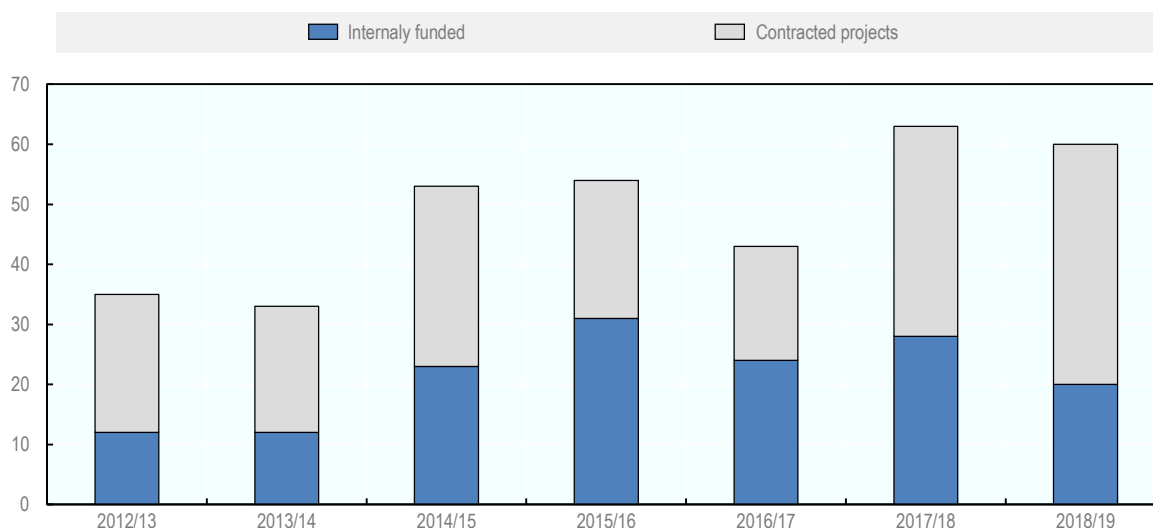
This report is not an evaluation of any specific Kuwaiti institution, not even one that account for almost all the national applied research capacity. The mixed performance highlighted above finds in great part its

roots in the environment in which KISR operates, notably a very small private sector, limited innovation awareness and capabilities of potential public clients, a small research and innovation budget (in proportion of the country's GDP) and the absence of a dedicated national innovation policy to steer a collective effort in this area.

### *KISR's research performance*

KISR completed 60 projects in 2018/19, a significant increase since 2012/13 (30 projects). The number of contracted projects has more than doubled between 2016/17 and 2018/19 (Figure 4.9). The majority (67% in 2018/19) were at least partially funded by an external partner (KFAS and the KOC account for the bulk of these projects). The Environment and Life Sciences Research Centre accounts for 19 projects and the Energy and Building Research Centre for 11, the Petroleum Research Centre for 8 projects. Four projects were carried out by the Water Research Centre. However, KISR external income remains due to small and in-kind contributions of clients.

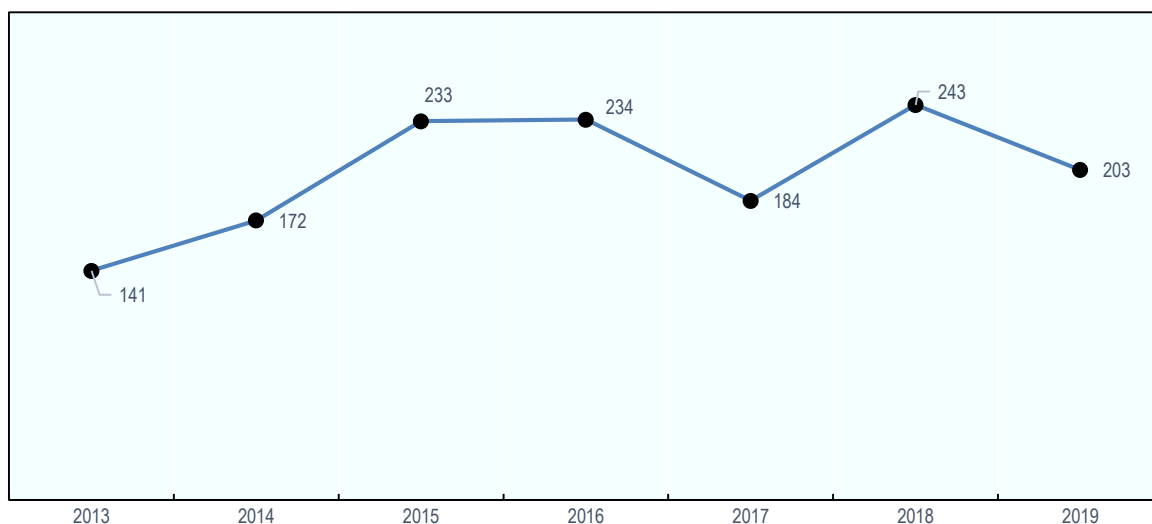
**Figure 4.9. KISR's internally funded and externally contracted projects (number of projects)**



Source: Data provided by KISR.

KISR's mission is, essentially, to carry out applied research for sustainable economic and social development. Hence, producing scientific publications plays only a subordinate role in its work. Given its size, it is nonetheless one of the biggest producers of scientific papers in Kuwait. According to KISR's own monitoring of publications, the number of publications has remained rather stable in recent years, following a significant increase from 2013 to 2015 (Figure 4.10).<sup>30</sup>

Figure 4.10. KISR's publications in its internal monitoring system, 2013-18



Source: Data provided by KISR.

KISR's own account of its publication between 2010 and 2017 (Table 4.10) indicates that these are biased towards Q1 journals, suggesting that while its overall production of scientific papers per year is modest in relation to the number of researchers, the quality of what is published is relatively good, with good representation in the highest quartile (KISR, 2015).

Table 4.10. KISR's indexed publications by quartile, 2010-17

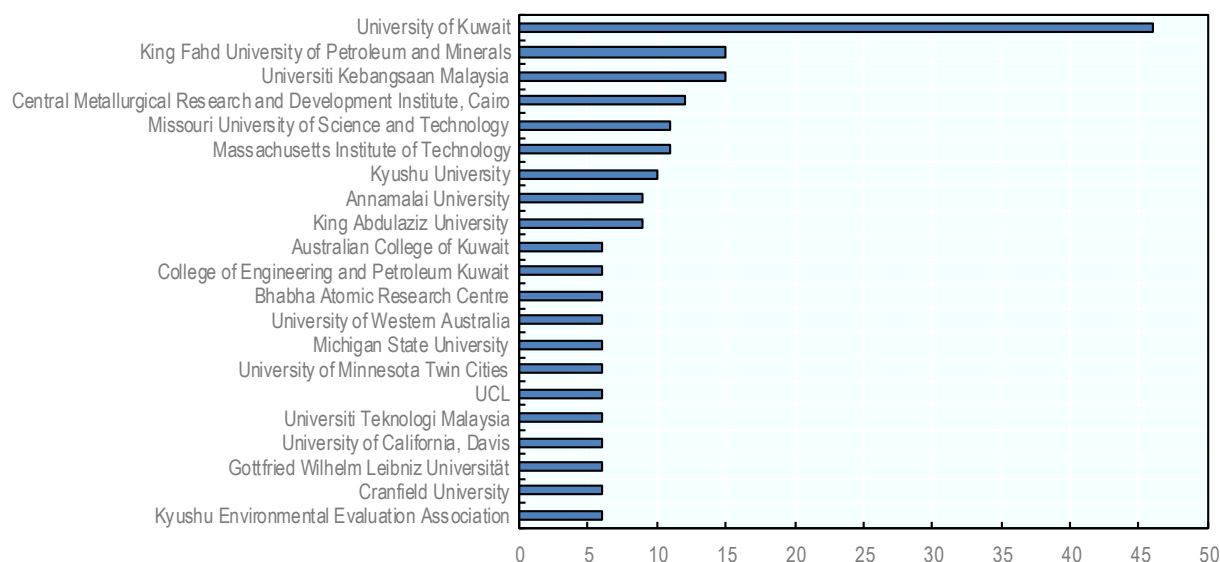
Quartile	Number of publications	% of total publications	% of indexed publications
Indexed Q1	108	32%	50%
Indexed Q2	49	15%	22%
Indexed Q3	49	15%	22%
Indexed Q4	12	4%	6%
Not indexed	116	35%	–
	334	100%	100%

Source: KISR (2015), 8th Strategic Plan: 2015-2020.

KU was KISR's main co-publication partner during the period 2017-19, but represents a low proportion of the total co-publications (Figure 4.11). Otherwise, it has research contacts with a good number of international universities. This translates into a wide and increasing array of countries with which KISR co-publishes, with the United States dominating, followed by Malaysia and the United Kingdom. The institute also co-publishes with a good mixture of countries from the Gulf, the developing and the developed world. KISR had co-publications with 43 other countries in 2008-10, growing to 119 in 2015-17. Compared with 2008-10, Malaysia, Saudi Arabia and Japan have become much more significant co-publication partners in the more recent period. Both the United States and the United Kingdom have been among the main co-publication partners across the whole period.



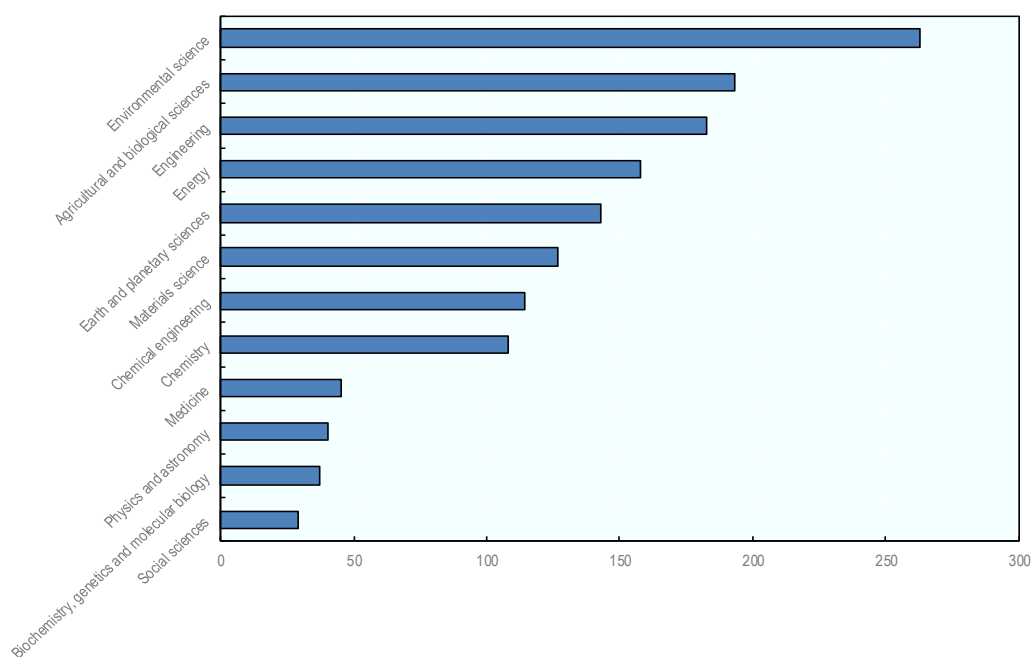
**Figure 4.11. KISR's co-publication partners, 2017-19**



Source: Scopus database, <https://www.scopus.com/search/form.uri?display=basic> (accessed on 10 January 2020).

During the period 2017-19, KISR published mainly in environmental science (18%), agricultural and biological sciences (12%), engineering and earth science (11%), planetary sciences (10%), and energy<sup>31</sup> (9%) (Figure 4.12). The way KISR's scientific production is distributed across subjects has mostly remained stable since 2008, though with a substantial drop in computer science and more modest percentage increases in chemistry and energy.

**Figure 4.12. Breakdown of KISR's scientific publications by subject area, 2017-19**



Source: Scopus database, <https://www.scopus.com/search/form.uri?display=basic> (accessed on 10 January 2020).

As any other applied research institute, KISR's main role is not to produce publications, but to support the technological development of Kuwait, in line with the national development strategy. No single indicator can shed light upon the performance of KISR in that respect and such assessment, which does not fall under the scope of this review, should be conducted in each thematic area. Box 4.6 provides an overview of the achievements in one of the areas in which KISR is relatively strong and which is a priority for Kuwait: water desalination technologies. This overview includes an identification of the main external and internal factors that support or hinder KISR's accomplishments in this area. Recently, KISR and the Ministry of Electricity and Water have started a new co-operation, which contrasts with earlier – more linear – traditional practices. A public servant is now assigned to work with KISR from the beginning of a research project so that s/he can learn about the merits and challenges of the new desalination technologies and help make the case for them within the ministry. This new practice might help alleviate some of the hurdles faced by KISR in its co-operative activities, in the desalination area but also in other fields where it could be replicated.

#### Box 4.6. KISR's achievements in the area of water desalination

Due to its challenging geographic and weather conditions, the supply and management of fresh water for various usages in Kuwait are of major importance for its economic and social development. The increasing demand for water (overall and per capita) calls for large investments and more efficient solutions. The share of water production by desalination in Kuwait currently exceeds 90%. The most commonly used desalination technologies are based on distillation processes, in particular the multi-stage flash distillation technology (MSF). However, most new desalination plants now use reverse osmosis (RO) membrane technologies. It is proven to be significantly less energy-intensive than conventional MSF and currently represents more than 60% of all installed capacity worldwide. The first commercial desalination plants using RO were inaugurated in California in 1965 (brackish water) and 1974 (sea water). The biggest desalination plants are in the United Arab Emirates, Saudi Arabia and Israel. In Saudi Arabia, out of the 27 desalination plants currently in operation, 8 are using RO. Reverse osmosis technologies account for 60% of capacity in Oman and roughly half of the capacity in Saudi Arabia. Although Kuwait was the first country in the Gulf Cooperation Council region to invest in desalination, starting in 1953 with a distillation plant, its desalination capacity is still currently mainly using MSF technology; RO only accounts for a minor share of desalinated water.

The improvement of water supply has been at the core of the Kuwait Institute for Scientific Research's (KISR) mission since its creation. It was among the themes emphasised in the 1958 concession agreement with the Arabian Oil Company (Japan) that set the ground for the creation of the institute. KISR has been a pioneer in applied research on conventional and non-conventional desalination technologies. It contributed significantly to improve MSF technologies in the 1970s and 1980s. Several brackish water RO units of 4 000 gallons per day using different types of membranes were tested by the Ministry of Electricity and Water in the early 1970s, who concluded that more research was needed. In the 1980s, co-operation was undertaken with the German Ministry of Research and Technology to identify and optimise RO membranes suitable to the Arabian Gulf seawater conditions. This partnership also included training of national manpower and transfer of RO technology to Kuwait. This joint research programme achieved significant technical advances in RO desalination technologies and demonstrated the viability of new membrane technologies. A first pilot plant was tested in the 1990s when KISR resumed its operation after the invasion by Iraq. KISR also co-operated with other Gulf countries that had started operating RO plants. However, public authorities finally agreed to implement it commercially to treat seawater only at the beginning of the 2010s (Shuwaikh plant).

Currently, desalination is still one of the core research themes of KISR's Water Research Centre (WRC). Between 2010 and 2017, two patents on water desalination were granted. Since 2004, the WRC completed 37 projects on water desalination.

One paradox is that although Kuwait was a pioneer in desalination research, it started to implement RO later than its neighbouring countries with a weaker research capacity in this area. As claimed by a WRC research staff, "*Kuwait was the first country to demonstrate the technology in the region and the last to implement it*".

Interviews and desk-based research in this area allows to list some of the reported explanations for the reluctance to adopt non-conventional – less energy-intensive – technologies:

- the reluctance of some government organisations to actively engage KISR in their long-term and strategic plans
- the absence of a clear plan for the implementation of new proven technologies, which would guide a reliable mid- to long-term research agenda at KISR
- the lack of a leader in relevant public authorities with the necessary power to promote the needed investment in and procurement of these new desalination technologies
- the tendency of public authorities to take decisions regarding future investment in desalination technologies without consulting KISR experts
- weak expertise in desalination technologies (and more generally lack of interest in and knowledge of research) of people in public authorities that are assigned to discuss with KISR
- the limited, although improving, commercialisation focus and customer orientation of KISR's staff
- bureaucratic process and audit rules resulting in lengthy procurement processes for equipment and materials
- the absence of a research budget and research department at the Ministry of Electricity and Water
- research budget restrictions (institutional funding from the Ministry of Finance and competitive funding from KFAS – the centre's major funding agency).

*Sources:* Information provided by KISR; KISR (2015), 8th Strategic Plan: 2015-2020; KISR (2018a), List of Completed Desalination and Distillation Projects of the Water Research Centre of KISR; Al-Zubaidi, A.A.J. (1987), "Sea water desalination in Kuwait: A report on 33 years' experience", [https://doi.org/10.1016/0011-9164\(87\)90039-7](https://doi.org/10.1016/0011-9164(87)90039-7); KISR (2018b), List of Granted Patents 1967-2017; Walton, M. (2019), "Desalinated water affects the energy equation in the Middle East", <https://www.iea.org/newsroom/news/2019/january/desalinated-water-affects-the-energy-equation-in-the-middle-east.html>.

### *Governance*

KISR was reorganised by an Amiri decree issued in 1973, under which it became directly responsible, via its board of trustees, to the Council of Ministers. The main objectives of the institute, as specified in the Amiri decree, were to carry out applied scientific research, especially related to industry, energy, agriculture and the national economy; to contribute to the economic and social development of the state; and to advise the government on scientific research policy.

A further Amiri decree, issued in 1981, formally established KISR as an independent public institution. The revised objectives of the institute remain to carry out applied scientific research that helps the advancement of national industry and to undertake studies relating to the preservation of the environment, resources of natural wealth and their discovery, sources of water and energy, methods of agricultural exploitation and

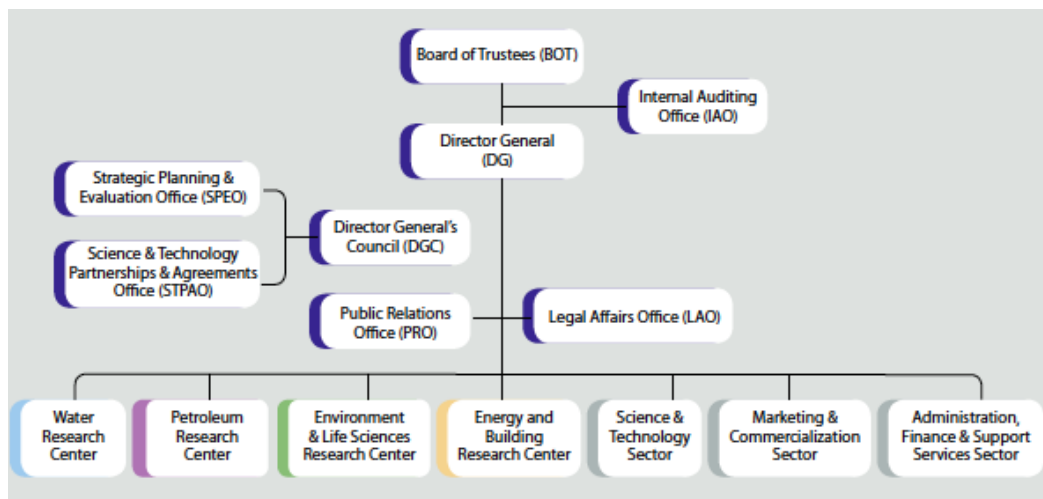
promotion of water wealth. The law entrusted the institute with undertaking research and scientific and technological consultations for both government and private institutions in Kuwait, the Gulf region and the Arab World. It confirmed KISR's role as a science advisor to the Kuwaiti government, a role which KISR intended to strengthen by providing the secretariat for the intended KSTIC advisory council (see Box 3.2).

Currently, KISR is governed by a board of trustees, chaired by the minister responsible for higher education. Other members represent major stakeholders, mainly in the government sector:

- KU;
- Ministries of Planning, Oil, Public Works, Electricity and Water, Commerce and Industry, Finance, Education, and Health;
- Kuwait Industrial Bank;
- KFAS;
- a scientific expert nominated by the board of trustees;
- KISR Director-General (rapporteur);
- a scientific advisor appointed by the board itself.

KISR's organisation (Figure 4.13) comprises four major research centres – Petroleum, Water, Energy and Buildings, and Life Sciences – and two smaller research units: the Techno-economics Division and the Software Systems Development Department, in addition to various support functions (including the Science and Technology Sector) and a commercialisation and technology transfer group.

**Figure 4.13. KISR's organisational chart under the 8th Strategic Plan**



Source: KISR, *8th Strategic Plan: 2015-2020*.

In 2009, the ADL undertook a large study of the strategy and process for KISR, helping underpin the “KISR transformation” project – a significant reorganisation of KISR, clarification of processes and the introduction of strategy planning tools in time for the 7th Strategic Plan, 2010-2015. One key dimension of this reorganisation was the gradual shift from a traditional R&D organisation serving the current needs of clients – ministries and oil companies for the most part – to a more forward-looking and result-oriented organisation. Achievements of this endeavour were, for instance, the creation of the Science and Technology Sector and the Marketing and Commercialisation Sector. This ambitious project faced some internal resistance, which significantly delayed its implementation. Some related initiatives were still being rolled out in 2019, such as the creation of a high-level internal scientific advisory committee.

## Strategy

KISR has developed five-year strategic plans since 1976 in order to guide its development. Since 1990, the timing of its strategic plans is aligned with that of the SCPD mid-year development plans (KISR, 2017).

As previously mentioned, the “KISR transformation” project resulted in new strategy planning tools being implemented in 2010, with some positive results (Arman, 2018). Since 2013, the Science & Technology Sector is in charge of developing and monitoring the implementation of the plans. The Techno-economic Analysis Department conducts economic studies to inform the strategic orientation of the institute.

While KISR’s overall goal at the time of its 4th Strategic Plan (1995-2000) was to be the “*preferred and efficient national supplier of research and access to technology in areas of national need*”, its ambition is now regional, as set out in its 8th Strategic Plan: “*By 2030, KISR will be internationally acknowledged as the region’s most highly respected STI and knowledge gateway, and recognised as a driving force for sustainable economic prosperity and quality of life*”. Beyond the Gulf region, while the institute cannot aspire to become a leading research institution, it aims at least to become acknowledged as an “international centre of excellence” in the 10<sup>th</sup> Strategic Plan (2025-30). Internal organisation efforts have also been at the core of KISR’s successive five-year plans (Table 4.11).

**Table 4.11. Core issues in KISR’s five-year plans to date**

Strategic plan	Period	Core issues
Strategic Plan 1	1979-84	Planning of management processes, research priorities and organisational structure.
Strategic Plan 2	1984-89	Strengthening the focus of core technical research programmes through strategic recruiting and clear alignment with national development priorities.
Strategic Plan 3	1992-95	Developing a transitional strategic programme to rebuild the institute’s capacity in the aftermath of the Iraqi invasion.
Strategic Plan 4	1995-2000	Aligned and prioritised national initiatives in collaboration with strategic stakeholders.
Strategic Plan 5	2000-05	Integrated advanced information technologies in support of core research initiatives and national priorities.
Strategic Plan 6	2005-10	Building up the capacity of the staff and upgraded facilities.
Strategic Plan 7	2010-15	Transforming KISR into a leading research and development institution in the region by “growing a regional footprint and building world-class niches.”
Strategic Plan 8	2015-20	Continuing to fulfil goals outlined by the 7th five-year plan with focus on a regional “footprint” and “world-class niches,” aimed at building an international reputation.

Source: Birzi, O.F. (2018), *Science, Technology, Innovation, and Development in the Arab Countries*, <https://doi.org/10.1016/C2016-0-01541-3>.

Due to its ongoing restructuring, the 7th Strategic Plan was not fully achieved and the implementation of 8th Strategic Plan was delayed (Al-Sudairawi, 2017). KISR is therefore currently in the middle of implementing its 8<sup>th</sup> Strategic Plan, 2015-2020 (KISR, 2015), which explicitly continues the work of the previous plan and states KISR’s commitment to:

- advancing science and technology in Kuwait;
- promoting growth and local industries;
- advancing diversity in energy production and enhancing the efficiency of energy use;
- contributing to the country’s oil industry;
- protecting the environment and biodiversity;
- ensuring that novel infrastructure projects that are being implemented produce efficient and reliable outcomes;
- contributing to meeting the country’s growing water needs.

Key performance indicators have been established for monitoring the results of operational processes as part of the 8th Strategic Plan (KISR, 2015). A monitoring system with annual targets covering most of the dimensions of its activity allow to monitor the Institute's progress.

The 8th Strategic Plan sets out a vision to become the leading STI performer in the region by 2030 while aligning its long-term R&D activities to the Kuwait Mid-Range Development Plan. The plan is not specific about how that alignment will be achieved at the project level, but points out that KISR's research centres and the Techno-economic Division all work in areas of importance to the Mid-Range Development Plan. It also emphasises actions to improve customer management and develop close links with both industrial customers and other research performers in Kuwait and abroad, to improve the quality of research and innovation within the institute and improve management, planning and administration. In that regard, KISR has made efforts to involve its clients and stakeholders (Ministries, SCPD, government agencies, K-companies, etc.) as early as possible (about a year ahead) in its strategic planning process in order to identify their problems and focus on relevant solutions. Most of them, however, do not have a formal or even informal innovation strategy and their inputs to drive KISR's activities are therefore limited. A notable exception is KPC, with which KISR has a strategic R&D Agreement. A mechanism has been put in place to align KISR with KPC's priorities in the mid- to long-term and joint teams allows to co-ordinate KISR R&D activities in and technical services to K-companies. The realisation of the plans is assessed internally. The results of this assessment are presented to the board and are expected to feed into the preparation of the following plan.

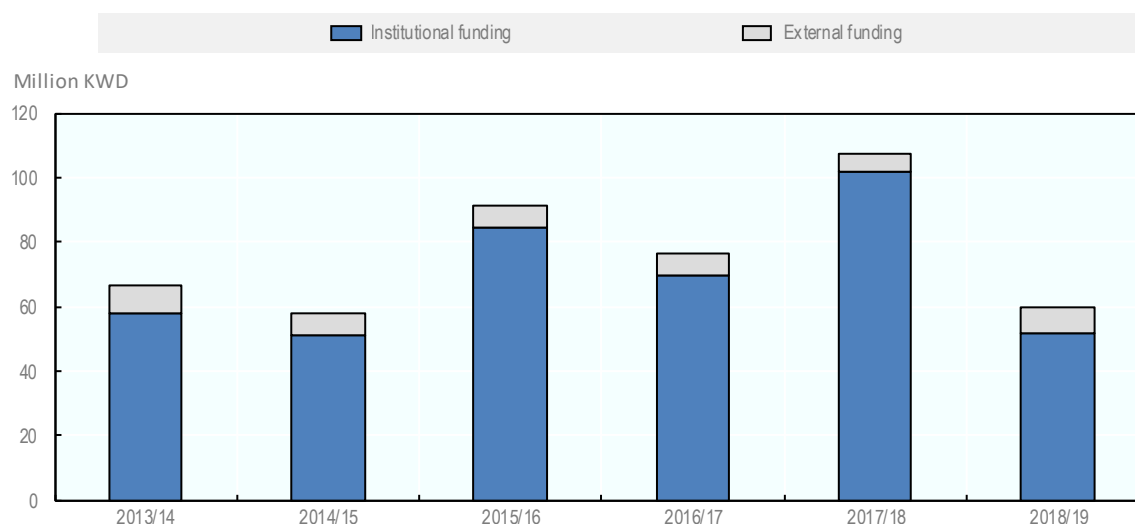
In order to improve its strategic guidance, KISR will create during the course of the 9<sup>th</sup> strategic plan an Advisory Council constituted of four to six internationally renowned leaders in the field of science and technology. In addition, a dedicated Advisory Board, composed of representatives of relevant national institutions will be created to support the orientation of each KISR Research Centre.

### *Funding*

KISR's annual budget at the start of the 8th Strategic Plan was approximately KWD 90 million and rose to over KWD 100 million in 2017/18. It fell by more than half in 2018/19. Salaries account for 30-40% in recent years (very stable in absolute terms, around KWD 32 million) and construction 40-50% (Figure 4.14).

The budget comprises a mix of government funding and direct funding by clients. External funding fluctuated between KWD 5.5 million and KWD 8.6 million during the period 2013-19, amounting to KWD 8.2 million in 2018/19 (16% of the total budget). KFAS is the principal external funder (22.5% of revenues), followed by K-companies (20%) and foreign institutions (8%). The small private sector in Kuwait account for only 6%, despite KISR effort to develop these cooperative activities, notably since the MRDP 2010-15. The rest of revenues is contributed by various national institutions. Over 200 private and public technical and consulting services<sup>32</sup> were being conducted annually (87 projects completed in 2013/14, including 72 funded contractually for a budget of KWD 1.8 million; 80 services in 2018, accounting for 37 different clients). One key deterrent of fundraising at KISR is the obligation to transfer the money raised to the Ministry of Finance, which is then subtracted from the planned institutional funding awarded to the institute. In essence, this implies that any contract raised translates into more work, without additional funding.

Figure 4.14. KISR's funding, 2014-19



Source: Data provided by KISR.

### Staff

In 2017/18, KISR had over 1 550 total staff, of which 910 were permanent employees. About 84% of its staff were Kuwaitis (64% among researchers only), with the balance coming from 20 different countries around the world. One-quarter of the permanent staff were researchers and 67% research assistants and associates, with the rest providing support. Just over a fifth of the 910 permanent staff held a PhD and 15% had a Master's degree. Forty-one per cent of the permanent staff were women, but this proportion falls to 27% when considering researchers only.

### 4.3.2. KFAS research centres

KFAS manages four external centres, including two dedicated to research, i.e. the Dasman Diabetes Institute (DDI) and the Jaber Al Ahmed Centre for Molecular Imaging and Nuclear Medicine (JAC) and one with partial research activities, i.e. the Scientific Centre of Kuwait. The last centre, the Sabah Al Ahmad Centre for Giftedness and Creativity (SAC), aims to develop youngsters' skills and promote innovation and knowledge exchange. The 2012 strategy introduced a life cycle management model into which it retrofitted KFAS' four existing centres with a view eventually to "graduating" these away from KFAS support and into other hands. Up to that point, KFAS had intermittently acceded to requests to establish and fund centres from its own resources – to such an extent that in 2012 they were responsible for 50% of KFAS' expenditure, therefore crowding out KFAS' primary mission.

The 2014 Strategic Review of KFAS pointed to several problems stemming from the position of these centres under the purview of KFAS (Technopolis, 2015). Not only were they were consuming a large and growing proportion of KFAS' total disposable funding, but the foundation seemed to have a limited control over these centres due to issues in management and governance mechanisms. For instance, their budgets seemed to be driven by past budgets rather than future strategy and their research agenda was developed bottom-up, driven by individuals' interests and opportunities. It also generated potential conflicts of interest, as KFAS acted as funder while participating in their governance. The Panel Review recommended that KFAS contribute to the reform of the centres until they can be spun-off to other funders (to the Ministry of Health in the case of the DDI and the JAC) or to establish performance contracts with them (in the case of the others), acting as an arm's-length buyer of a defined set of services at an agreed level of quality.

### *The Dasman Diabetes Institute*

The DDI's mission is to address the diabetes epidemic in Kuwait through focused research, integrated prevention, training and education (DDI, 2018). It was set up on the instructions of the Amir in 2006 and is funded by KFAS. It aims to perform research (basic and clinical) on diabetes as well as diabetes public education activities, a disease of very high prevalence in Kuwait. It aims to become the leading diabetes institute in the Middle East and North Africa region and to be recognised internationally (DDI, 2018).

The DDI had a budget of KWD 7.88 million in 2020 (rather stable since 2017, but steady decrease in previous years: KWD 8.32 million in 2016 and KWD 9.4 million in 2014). In 2013, its budget covered by KFAS (KWD 12 million) accounted for 48% of KFAS' total budget contribution to research (estimated at about KWD 32 million) (Al-Sayed Omar, 2014). The MOH provides about KWD 3 to 4m in-kind.

The DDI had 313 employees in 2020 (including part time and contractual staff), of which 217 non-Kuwaitis and 26 staff with PhDs. There were 223 employees of 23 different nationalities in 2016 (including 57 Indians and 45 Kuwaitis) (DDI, 2016).

A 2014 peer review (Kahn et al., 2014) concluded that the institute had become a leading national player in diabetes research with some international recognition. It, however, expressed concern about the lack of focus and orientation of its research activities towards specific Kuwaiti problems. More generally, DDI research was assessed as a bottom-up collection of individual researcher-led projects, without an overall strategy from the top, which led to a broadening of the research towards other diseases (hypertension, cardiovascular disease, sleep apnoea, etc.). As a result of this dispersion, much of the research was sub-scale and addressed problems being tackled at a large scale elsewhere in the world. The report urged reform, and the separation of treatment from research, with the Ministry of Health to take over the costs of treatment. A change of leadership (a new director general, the hiring of a chief scientific officer), the development of a research strategy and significant restructuring has enabled a refocusing of the institute (KFAS, 2017b). KFAS has also supported these reforms, with a view to hand-over part of the costs of DDI to the Ministry of Health in the future. An agreement has been found, whereby the MOH provides in-kind support to DDI in the forms of medical supplies and secondments. MOH also supports financially some agreements with international partners. The negotiations with MOH are still on-going.

DDI's publications have increased substantially in recent years, from 22 in 2013 to 77 in 2019 (73 in 2016). Even more remarkable is the increase of 'original research' from 25 in 2016 to 50 in 2019.<sup>33</sup> It currently has about 70 ongoing projects (50 in 2014). Also noteworthy is the recent increase in the number of national collaborative projects with KU and MOH from 2017 to 2020. DDI's IP is very limited to date as its TTO office was only created in 2018.

Besides research, the DDI carries out a number of clinical services.

### *The Jaber Al Ahmed Centre for Molecular Imaging and Nuclear Medicine*

The JAC started operating in 2013. Its mission is to provide a Positron Emission Tomography (PET) and Single Photon Emission Computed Tomography (SPECT) clinical imaging services to patients and to provide academic infrastructure for scientific research. However, it hosts only a small volume of medical research that relies on imaging. It is a facility for advanced medical imaging, providing diagnostic services for the Ministry of Health, and the production of fluorodeoxyglucose, a radioactive isotope used in PET scans for medical imaging.<sup>34</sup>

In 2016, the centre signed an agreement with the International Atomic Energy Agency (IAEA) to work jointly in establishing the centre as an IAEA Collaborating Centre, providing a platform for regional training activities of the IAEA in nuclear medicine (KFAS, 2017b).



The JAC is managed by doctors from the Ministry of Health. It is funded by KFAS and receives some in-kind support from MOH, with a budget of KWD 3.24 million in 2017 (KWD 3.83 million in 2016). KFAS provided KWD 1.045m in 2016 and KWD 0.970m in 2017.

KFAS has initiated discussions with the Ministry of Health regarding the preparation of a sustainability plan to provide viable alternatives to handing the centre back to the Ministry of Health, and developing a research strategy.

#### 4.4. Research by MOH physicians in hospitals

Some MOH physicians working at local private and public hospitals perform significant research activities, as demonstrated by their number of scientific publications. For instance, the publications of physicians working at Amiri hospital have increased from 24 in 2011 to 58 in 2019. Those at the Mubarak Al-Kabeer Hospital have also published 20 to 40 articles annually between 2011 and 2019. Al-Sabah Hospital publishes around 15 to 30 articles per year during the same period. Most of the publications of these hospitals have been produced in collaboration with researchers from KU or the Health Sciences Centre.

These performance are rather remarkable since there is very little institutionalisation of research activities, both in hospitals and at MOH. There is no obligation nor dedicated time (or time flexibility) for doctors to perform any research activities in their home institution (but research activities are considered for career promotions). Nor any dedicated programme, department or scheme to support research at the MOH. Hence, doctors in hospitals who decide to engage in research activities do it on their own initiative. They inform and seek approval from the MOH but have to secure funding elsewhere.

KFAS is an important funder of research initiated by MOH physicians in hospitals through its calls for research proposals. In 2017, KFAS contribution to research in hospitals was about KWD 109K (not including salaries and in-kind contributions from MOH, providing for instance medical equipment and materials). Between 1978 and 2017, KFAS awarded KWD 1.2m to 44 research projects in hospitals, which represents 4% of the total number of projects awarded by KFAS during this period (KFAS, 2017c).

Research in health has become a growing priority at KFAS which has led to more funding being invested in this area. Some projects are also financed partially through KU internal funding scheme when conducted in collaboration with KU academics. Finally, a few doctors performed research in cooperation with pharmaceuticals. No data is available on private sources of funding.

#### 4.5. KFAS' competitive and strategic research funding

Apart from the institutional funding received by each institution, KFAS is the main source of external funding of basic and applied research. This section focuses on research funding and does not intend to reflect the entirety of KFAS' activities to support research via other complementary means (for instance, via a number of prizes awarded to renowned researchers, the organisation of or support to scientific and networking events to raise the awareness of policy makers and citizens on the importance of science, training and support to the mobility of students and researchers, etc.).

##### 4.5.1. KFAS' Research Directorate structure and research grant portfolio

Since 1977, KFAS' Research Directorate (RD) supports the advancement of science and research in Kuwait in different ways, mainly through the allocation of research grants, but also through its support to researcher and research institutions' capacity building and networking. Currently with a staff of about 20, the RD is responsible for the implementation of the Strategic Thrust 2 of KFAS' Strategic Plan 2017-2021 "Enhancing R&D capacity in Kuwaiti scientific institutions", which aims to (KFAS, 2017b):

- enhance the national research profile and capacity;
- build capacity within the research community through initiatives in collaboration with international entities;
- steer research activities towards national priority issues;
- accelerate the deployment of technologies benefiting society.

In order to realise these objectives, the RD operates three programmes: the Research Grant Program, the Capacity Building Program and the Flagship (or “Mega”) Projects Program. For the most part, these programmes operate via the competitive allocation of grants to researchers through their organisation following a peer review process, following different rules according to the type and size of grant. Some funds are allocated in a more top-down fashion to initiate projects of direct relevance to national priorities. The different types of grants are (KFAS, 2016a):

- National Priority Research Grants: These grants are designed to address research areas of national priority, in line with the National Development Plan of Kuwait.
- Early Career Research Grants are intended to support early career researchers (within 7 years from completing their Ph.D. degree) towards establishing their research careers and enhancing their professional development, in priority areas. Funding limit is KWD 10 000.
- Exploratory/Developmental Grants aim to support research proposals in early and conceptual stages of development, which, if successful, may lead to a breakthrough in the development of novel techniques, agents, methodologies, models, or applications, in priority areas. Funding limit is KWD 10 000.
- General Grants are intended to support proposals that span all research fields, beyond national priority areas, from basic sciences to industrially applicable sciences, technical innovations, and research related to the need of the Kuwaiti private sector, and research that have clearly demonstrated application of high value to the society and economy of Kuwait.

In 2015, KFAS was subject to a panel review of its progress in implementing its 2012-16 Strategic Plan. The conclusions of this exercise led to a significant restructuring and reorientation of KFAS. The main conclusions for the Strategic Thrust 2 are synthesised in Box 4.7.

#### Box 4.7. Main conclusions of the 2015 KFAS panel review: Strategic Thrust 2 (research)

Strategic Thrust 2 (ST2) plays an important role in the Kuwaiti research and innovation funding system by providing external, competitive, project-based research funding as a complement to that which research-performing organisations provide through their own institutional funding.

##### ST2 P1 Research Grant Programme

- This programme acts as Kuwait’s quasi-national research funding council, funding investigator-led proposals “bottom-up”. It has demonstrated significant improvement over the period 2012-16. This important function must continue, although administrative efficiency could be further improved.
- The monitoring of the scientific quality of Kuwaiti research outputs (bibliometric study) would clarify the need for development and could be used not only to help KFAS focus its efforts, but also to encourage the management of research-performing organisations to develop their organisations’ capabilities further.

##### ST2 P2 Environmental and P3 Water and Energy Research Programmes

- These programmes channel research efforts towards areas of national importance where significant innovations are needed. They continue functions that KFAS has performed since its early days. The direction of the ST2’s work is correct and consistent with KFAS’ mission, but it needs to be done more efficiently.
- KFAS could consider using visits by foreign peer reviewers as a way to support capacity building in research organisations as well as funding capacity-building behaviour in the research organisations.
- Governance should be broadened to prevent capture by the beneficiaries and expose the research to demands and opportunities from the wider world.
- The ST2 could benefit from an international scientific advisory committee – both as a way to get scientific advice on its operations and as a tool for encouraging the development of the research system more widely.

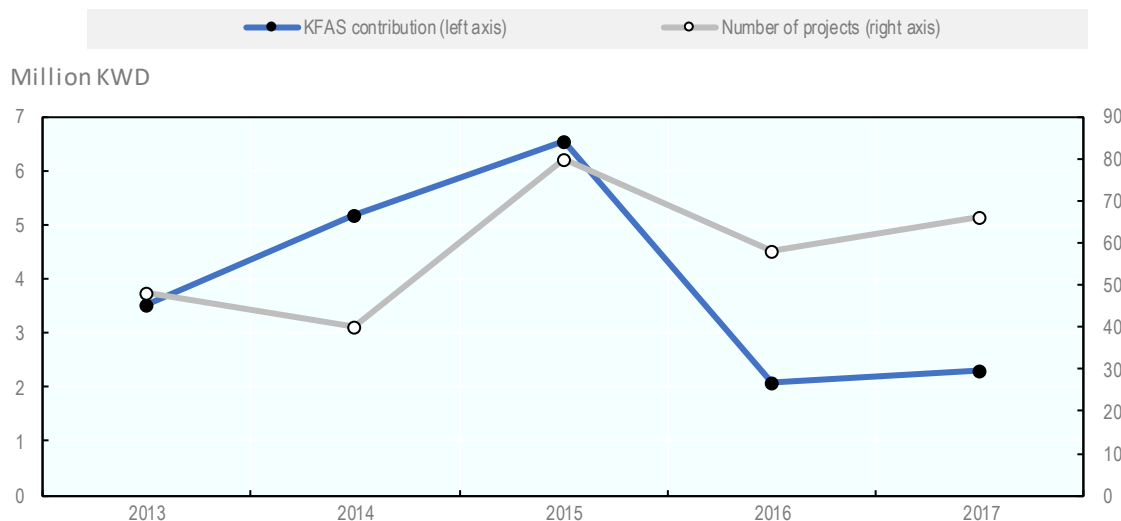
Source: Technopolis (2015), KFAS Strategic Review, Final Report.

In addition to the three programmes mentioned above, a newly created Collaborative Research Unit manages specifically the research-related aspects of regional and international collaborations with a number of leading foreign institutions such as SciencePo, Harvard Business School, London School of Economics, etc.<sup>35</sup>. These activities partly use the different types of grants previously listed. One of the most important and longer-term collaborations is the one with the Massachusetts Institute of Technology (MIT) that used to be managed by the MIT and paid for entirely by KFAS. In order to enhance the impact of this partnership in Kuwait (through technology transfer, capacity building of researchers of KU and KISR, etc.), it is now directly managed by KFAS. The Collaborative Research Unit allocated KWD 1.43 million to the Kuwait-MIT programme in 2017. It currently includes collaborative projects on desalination and sewage treatment.

### 4.5.2. Funds allocated to research

In 2017, KFAS awarded KWD 2.33 million in grants (KWD 2.07 million in 2016), a significant decrease compared to 2015 (Figure 4.15). The average size of grants has also decreased, from KWD 130 000 in 2014 to KWD 35 000 in 2017.

Figure 4.15. Number of projects and amount of funds allocated by KFAS Research Sector, 2013-17



Sources: KFAS (2017d), *Research Directorate Annual Report 2017*, <https://www.kfas.org/media/addba2c1-5dfe-4b03-8697-5fe2b9bc5389/t-93VA/Publications/Files/RD%20Annual%20Report%202017%20en%20-%20web.pdf>; KFAS (2016b), *Research Directorate Annual Report 2016*, Kuwait Foundation for the Advancement of Sciences; KFAS (2014j), *Research Directorate Annual Report 2014*, <https://www.kfas.org/media/231f32d0-8ddb-478f-a873-1054cd0271cd/4PsZ1A/Publications/Files/KFAS%20Research%20Annual%20Report%202014%20-%20EN.pdf>.

Funds are allocated mainly through the general competitive grants. The Flagship Project Programme, which deals with national priority research grants, accounted for about 8% of allocated funds in 2017. These projects come in smaller numbers and are concentrated in the areas of water, environment and energy.<sup>36</sup> Among these projects are, for instance, the development of a Kuwait energy strategy or support for the installation of home photovoltaic systems (both by KISR). KFAS has long been a supporter of research and demonstration of sustainable technologies. It has helped fund several pilot projects in the area of solar energy systems, such as the Shagaya Renewable Energy Park, but considers it has neither the necessary resources nor the mandate to scale-up these activities. The handover to the Ministry of Electricity and Water has proved difficult and the development and diffusion of these technologies has experienced delays as a consequence.

During the period 2015-17, KFAS selected 215 projects and awarded about KWD 11 million (hence about KWD 3.7 million per year, but with significant variations, as shown in Figure 4.16) to various Kuwaiti research institutions, as well as to some international partners (mainly US universities). On average, projects received KWD 53.4 000. In most cases, the host institution of the beneficiaries contribute to the project since KFAS does not cover all the costs (salaries for instance). The main recent beneficiaries are KISR and KU, as well as one private university (Table 4.12). Apart from the recent emergence of private universities among its beneficiaries, as evidenced by the good performance of the Gulf University for Science and Technology in 2017, KFAS does not finance research in private companies under its research grant programmes.

**Table 4.12. Main beneficiaries of KFAS' research grants, 2015-17**

	Number of projects	KFAS grant		Co-funding		Co-funding rate
		Total amount (KWD)	Average	Total amount (KWD)	Average	
Kuwait Institute for Scientific Research (KISR)	61	2 650 478	43 450	6 697 088	115 467	72%
Kuwait University (KU)	54	3 677 579	68 103	2 921 108	59 614	44%
Gulf University for Science and Technology	31	404 006	13 032	258 484	13 604	39%
Ministry of Health	12	332 107	27 676	585 698	73 212	64%
Public Authority for Applied Education and Training (PAAET)	9	176 704	19 634	508 766	56 530	74%

Source: Data provided by KFAS.

In a longer term perspective, KISR (with about KWD 20 million, or 40% of the total funds awarded) and KU (KWD 14 million, or 28%) have accounted for the bulk of the KWD 45 million of funding awarded by KFAS to research institutions since it started operating in 1978 (KFAS, 2017c). The amounts received by these institutions per year remain rather limited, both in total and in average, although they are generally bigger in size than the projects financed internally by these institutions. Given the paucity of available external funding, KFAS is still their main external funder. During interviews, officials at both KISR and KU expressed strong concerns about KFAS' decreasing research grant budget, in total volume and per project.

### **4.5.3. Grant allocation process**

The process for awarding grants is well-structured and calls upon international reviewers for selecting the proposals (430 reviewers were mobilised in 2017). Larger projects go through a multi-stage reviewing mechanism comprising a review by international peers and the Research Funding Council. The council, comprising KFAS' Deputy Director General for Strategic Thrust Programs and RD director, as well as external experts from national institutions, adds a top-down element to the selection of large projects by ensuring their relevance to national priorities.

All grants included, KFAS received 140 proposals and rejected 24 in 2017 – hence an acceptance rate of 83%. This rate is in line with results obtained in previous years, despite the lower number of proposals (223 proposals received and 188 selected in 2012; 254 proposals received and 213 selected in 2013). Although this rate widely varies among countries and scientific disciplines, it is lower in most research agencies of OECD countries with a strong research base. A recent survey undertaken by the OECD Global Science Forum found that a majority of research support schemes have success rates of 10-40% (OECD, 2018a). During interviews, KFAS officials stressed that the quantity and quality of research proposals is often weak, but regularly improving. KFAS' management costs are consistent with international practices, around 5-6% in recent years (in the 20-30% range prior to 2010).<sup>37</sup>

## References

- ACK (2018a), ACK Annual Report for the Academic Year (2016/2017), Australian College of Kuwait.
- ACK (2018b), *Faculty Research Output 2016/2017*, Australian College of Kuwait.
- AIT et al. (2017), *Background report OECD Review of Innovation Policies: Austria*.
- Al-Mutairi, A., K. Naser and M. Al-Enezi (2017), "Job Satisfaction among Academicians at Business Colleges Operating in Kuwait", *Asian Social Science*, Vol. 13/12, p. 9, <http://dx.doi.org/10.5539/ass.v13n12p9>.
- Al-Saadi, Y. (2015), "Overview of Kuwait's educational landscape", *HEAR Working Papers*, Higher Education in the Arab Region, <http://arabhighered.org/wp-content/uploads/2015/11/Al-Saadi-Kuwait.pdf>.
- Al-Sayed Omar, E. (2014), *Scientific Research Initiatives in Kuwait*, Kuwait Foundation for the Advancement of Sciences.
- Al-Sudairawi, M. (2017), *Science & Technology Sector (STS) Role in KISR Transformation*, Powerpoint presentation, Kuwait Institute for Scientific Research.
- Al-Zubaidi, A. (1987), "Sea water desalination in Kuwait: A report on 33 years' experience", *Desalination*, Vol. 63, pp. 1-55, [https://doi.org/10.1016/0011-9164\(87\)90039-7](https://doi.org/10.1016/0011-9164(87)90039-7).
- ANR (2017), *Soutenir la recherche sur projets dans sa diversité: Rapport d'activité 2017*, Agence Nationale de la Recherche, <https://anr.fr/fileadmin/documents/2018/ANR-rapport-activite-2017.pdf>.
- Arman, H. (2018), "The influence of the strategic planning approach on the research agenda of RD organizations", in F. Calisir and H. Camgoz Akdag (ed.), *Industrial Engineering in the Industry 4.0 Era*, Springer.
- Arnold, E. et al. (1999), *Evaluation and SWOT Analysis of KISR's Fourth Strategic Programme (1995-2000)*, Technopolis.
- Barham, B., J. Foltz and D. Prager (2014), "Making time for science", *Research Policy*, Vol. 43/1, pp. 21-31, <http://dx.doi.org/10.1016/J.RESPOL.2013.08.007>.
- Bizri, O. (2018), *Science, Technology, Innovation and Development in the Arab Countries*, Elsevier, <https://doi.org/10.1016/C2016-0-01541-3>.
- Borowiecki, M. and C. Paunov (2018), "How is research policy across the OECD organised?", *OECD Science, Technology and Industry Policy Papers*, No. 55, OECD Publishing, Paris, <https://doi.org/10.1787/235c9806-en>.
- DDI (2018), *Strategic Business Plan 2018-2022 Overview*, Dasman Diabetes Institute, Kuwait City.
- DDI (2016), *Annual Report 2016*, Dasman Diabetes Institute, Kuwait City, <https://www.dasmaninstitute.org/wp-content/uploads/2019/12/Annual-Report-2016.pdf>.
- Franzoni, C., G. Scellato and P. Stephan (2011), "Changing the incentives to publish", *Science Policy*, Vol. 333/6 043, pp. 702-703, <http://dx.doi.org/10.1126/science.1197286>.
- Ghareeb, N. (2010), *Academic Freedom of Faculty Members at Kuwait University: Issues of Understanding and Freedom of Research and Publishing*, PhD Thesis, Cardiff University, <http://orca.cf.ac.uk/54406>.
- Hanover Research (2013), *Strategic Planning in Higher Education: Best Practices and Benchmarking*, Hanover Research, <https://www.hanoverresearch.com/insights-blog/strategic-planning-in-higher-education-best-practices-and-benchmarking/>.
- Huisman, J. (2017), "Institutional diversity in higher education, institutional profiling", in J.C. Shin & P. Teixeira (ed.), *Encyclopedia of International Higher Education Systems and Institutions*, Springer, [http://dx.doi.org/10.1007/978-94-017-9553-1\\_32-1](http://dx.doi.org/10.1007/978-94-017-9553-1_32-1).

- Huisman, J. et al. (2015), "Measuring institutional diversity across higher education systems", *Research Evaluation*, Vol. 24/4, pp. 369-379, <http://dx.doi.org/10.1093/reseval/rvv021>.
- Kahn, R. et al. (2014), *Peer Review of the Dasman Diabetes Institute*, Technopolis, Brighton.
- KFAS (2017a), *Background report for the country of Kuwait - OECD country review 2017*, KFAS.
- KFAS (2017b), *KFAS High-level Strategic Plan 2017-2021*, Kuwait Foundation for the Advancement of Sciences.
- KFAS (2017c), *Research Directorate Annual Report 2017*, Kuwait Foundation for the Advancement of Sciences, <https://www.kfas.org/media/addba2c1-5dfe-4b03-8697-5fe2b9bc5389/t-93VA/Publications/Files/RD%20Annual%20Report%202017%20en%20-%20web.pdf>.
- KFAS (2017d), *Annual report - 2017*, KFAS, <https://www.kfas.com/media/publications>.
- KFAS (2016a), *KFAS Research Grant Manual*, Kuwait Foundation for the Advancement of Sciences, <http://www.kfas.com/media/09599ceb-5bd6-470b-ae32-00490bb91e4a/hkJDAA/Documents/KFAS%20Research%20Grant%20Manual%20Call%202016.pdf>.
- KFAS (2016b), *Research Directorate Annual Report 2016*, Kuwait Foundation for the Advancement of Sciences.
- KFAS (2014), *Research Directorate Annual Report 2014*, <https://www.kfas.org/media/231f32d0-8ddb-478f-a873-1054cd0271cd/4PsZ1A/Publications/Files/KFAS%20Research%20Annual%20Report%202014%20-%20EN.pdf>.
- KISR (2018a), *List of Completed Desalination and Distillation Projects of the Water Research Centre of KISR*, Kuwait Institute for Scientific Research.
- KISR (2018b), *List of Granted Patents 1967-2017*, Kuwait Institute for Scientific Research.
- KISR (2017), *Five Decades of Research, Development and Innovation*, Kuwait Institute for Scientific Research.
- KISR (2015), *8th Strategic Plan: 2015-2020*, Kuwait Institute for Scientific Research.
- Koier, E. et al. (2016), *Spinning Plates: Funding Streams and Prioritisation in Dutch University Research*, Rathenau Instituut, The Hague, <https://www.rathenau.nl/en/knowledge-ecosystem/spinning-plates>.
- KRRP (2007), *Report of the Kuwait Research Review Panel*, Kuwait Research Review Panel.
- KU (2018), *KU at a Glance 2018*, Kuwait University.
- KU (2017), *KU Research Sector Accomplishments - 2015/6*, Kuwait University.
- KU (2015), *Strategic Plan 2013-2017*, Office of the Vice President for Planning, Kuwait University, <http://www.planning.kuniv.edu.kw/download/%D8%A7%D9%84%D8%AE%D8%B7%D8%A9%20%D8%A7%D9%84%D8%A5%D8%B3%D8%AA%D8%B1%D8%A7%D8%AA%D9%8A%D8%AC%D9%8A%D8%A9/En/Stratigical%20Plan.pdf>.
- Kwiek, M. (2016), "The European research elite: A cross-national study of highly productive academics in 11 countries", *Higher Education*, Vol. 71, pp. 379-397, <http://dx.doi.org/10.1007/s10734-015-9910-x>.
- OECD (2019), *OECD Reviews of Higher Education, Research and Innovation Policy: Portugal*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264308138-en>.
- OECD (2018a), "Effective operation of competitive research funding systems", *OECD Science, Technology and Industry Policy Papers*, No. 57, OECD Publishing, Paris, <https://doi.org/10.1787/2ae8c0dc-en>.
- OECD (2018b), "The governance of public research policy across OECD countries", in *OECD Science, Technology and Innovation Outlook 2018: Adapting to Technological and Societal Disruption*, OECD Publishing, Paris, [https://doi.org/10.1787/sti\\_in\\_outlook-2018-14-en](https://doi.org/10.1787/sti_in_outlook-2018-14-en).

- OECD (2018c), *OECD Reviews of Innovation Policy: Austria 2018*, OECD Reviews of Innovation Policy, OECD Publishing, Paris, <https://doi.org/10.1787/9789264309470-en>.
- OECD (2017), *OECD Reviews of Innovation Policy: Norway 2017*, OECD Reviews of Innovation Policy, OECD Publishing, Paris, <https://doi.org/10.1787/9789264277960-en>.
- OECD (2016), *OECD Reviews of Innovation Policy: Luxembourg 2016*, OECD Reviews of Innovation Policy, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264232297-en>.
- OECD (2015), *The Innovation Imperative: Contributing to Productivity, Growth and Well-Being*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264239814-en>.
- OECD (2013), *Education at a Glance 2013: OECD Indicators*, OECD Publishing, Paris, <https://doi.org/10.1787/eag-2013-en>.
- OECD (2010), *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264083479-en>.
- PAEET (2019a), *Research Report 2018*, Public Authority for Applied Education and Training, <http://paaetwp.paaet.edu.kw/ResearchAdmin/wp-content/uploads/2019/08/RR2018.pdf>.
- PAEET (2019b), *Explanatory Note to the Final Account for the Fiscal Year 2018-2019*, Public Authority for Applied Education and Training.
- Pruvot, E., A. Claeys-Kulik and T. Estermann (2015), *Designing Strategies for Efficient Funding of Universities in Europe*, European University Association, Brussels, <https://eua.eu/downloads/publications/designing%20strategies%20for%20efficient%20funding%20of%20universities%20in%20europe%20define.pdf>.
- Technopolis (2015), *KFAS Strategic Review, Final report*, Technopolis, Brighton.
- THE World University Rankings (2019), *Top Universities With the Best Student-to-staff Ratio 2019*, Times Higher Education, <https://www.timeshighereducation.com/student/best-universities/top-universities-best-student-staff-ratio> (accessed on 29 October 2019).
- Walton, M. (2019), *Desalinated water affects the energy equation in the Middle East*, IEA News, <https://www.iea.org/newsroom/news/2019/january/desalinated-water-affects-the-energy-equation-in-the-middle-east.html>.
- World Bank (2016), *International Trends and Good Practices in Higher Education Internal Funding and Governance*, World Bank, [https://www.che.de/wp-content/uploads/upload/LV\\_2nd\\_HEd\\_RAS\\_Ph1\\_Trends\\_and\\_Practices\\_20Dec16\\_post\\_review\\_final\\_2055.pdf](https://www.che.de/wp-content/uploads/upload/LV_2nd_HEd_RAS_Ph1_Trends_and_Practices_20Dec16_post_review_final_2055.pdf).



## Notes

<sup>1</sup> In Finland, for instance, the Academy of Finland provides funding to support and speed up the strategic profiling of Finnish universities in order to improve their capacity for enhancing the quality and relevance of their research activities. See: <https://www.aka.fi/en/research-and-science-policy/university-profiling>.

<sup>2</sup> Notably, they are based on a limited set of indicators, many of which derive from surveys.

<sup>3</sup> SDG 10 – Reduced inequalities; SDG 11 – Sustainable cities and communities; SDG 16 – Peace, justice and strong institutions; SDG 17 – Partnerships for the Goals.

<sup>4</sup> Several of these hindering factors are discussed in more depth later in this chapter.

<sup>5</sup> Monitoring data provided by Kuwait University.

<sup>6</sup> In absolute numbers, out of 1 591 faculty in 2017/18, 349 had issued at least one publication. It should be noted that the review team, using Scopus, has found a larger number of KU publications for recent years.

<sup>7</sup> Q1 journals are those in the first quartile of journals ranked by level of impact factor according to the JCR ranking.

<sup>8</sup> Information provided by KU's Office of the Vice President for Research (June 2019). See also the website of KU's College of Engineering and Petroleum, which details the planning process: [www.eng.kuniv.edu/?com=content&act=view&id=342](http://www.eng.kuniv.edu/?com=content&act=view&id=342).

<sup>9</sup> Budget data were provided by KU. Data on the number of students until 2015/16 are available on the statistics page of the KU website: [www.planning.kuniv.edu.kw/Statistics\\_En\\_1.aspx](http://www.planning.kuniv.edu.kw/Statistics_En_1.aspx).

<sup>10</sup> In 2016/17, the Research Sector was allocated only KWD 652 000. The KU Finance Department covered additional expenditures.

<sup>11</sup> KU's first budgetary allocation for research was in 1979/80 (KWD 0.5 million).

<sup>12</sup> In 2005-06, research at KU accounted for 1.6% of the university's total budget (not including tenured faculty wages) (KRRP, 2007).

<sup>13</sup> Information provided by KU.

<sup>14</sup> Based on an assumption of an average wage of KWD 35 000 per year for faculty members, a 30% overhead rate and 22% of the staff spending 30% of their time in research on average.

<sup>15</sup> The survey is based on 141 responses from academic staff in business colleges, including 42 from public universities (21 in both KU and PAEET). This low number of responses does not allow conclusions to be drawn at the level of each institution.

<sup>16</sup> Also known as “new universities”, post-1992 universities are mainly former polytechnics in the United Kingdom that were given university status through the Further and Higher Education Act 1992, or institutions that have been granted university status since 1992.

<sup>17</sup> Scientific leaves allow Kuwaiti faculty to perform research activities through affiliation to universities and scientific institutions abroad. Going on a scientific mission can take place after two years of teaching at the university.

<sup>18</sup> There were 5 PhD students in natural science, 19 in medical and health sciences, and 48 in humanities in 2017/18.

<sup>19</sup> As previously mentioned, these bibliometric data are likely to be underestimated for previous years.

<sup>20</sup> See Barham, Foltz and Prager (2014) and Kweik (2016).

<sup>21</sup> For instance, a KWD 600 000 grant over 36 months was awarded to a project on photovoltaics. The largest “research units and laboratories” project was awarded KWD 940 000 (KU, 2017).

<sup>22</sup> Q1 journals are those in the first quartile of journals ranked by level of impact factor according to the JCR ranking.

<sup>23</sup> Almost equally male and female. About one-quarter in law, and about a tenth in science, engineering and Islamic studies.

<sup>24</sup> HESA statistics: <https://www.hesa.ac.uk/news/17-01-2019/sb252-higher-education-student-statistics>.

<sup>25</sup> Assuming a five-year completion and no dropouts from the PhD programmes, there would be  $(445+72)/5=103$  graduates per year.

<sup>26</sup> Information provided by PAEET (document in Arabic, OECD translation).

<sup>27</sup> Colleges: Basic Education, Business Studies, Health Science, Technological Studies. Institutes: Higher Institute of Energy, Higher Institute of Telecommunication and Navigation, Industrial Training Institute, Nursing Institute, Constructional Training Institute, Vocational Training Institute.

<sup>28</sup> Information provided by PAEET.

<sup>29</sup> This is for instance the case of the American University of the Middle East.

<sup>30</sup> OECD own analysis of KISR publications based on the Scopus database shows significantly lower numbers of publications for earlier year and rather consistent numbers for recent years. This might be related with the extension of the scope of publications indexed in the Scopus database, now covering also the academic literature where KISR authors publish. Also, KISR internal rules have recently changed. Prior to 2018, some publication projects that were not published in the end could be included in the Institute’s own statistics. Conversely, after the 2018 reform of publishing rules, some publications might not be reported to KISR.

<sup>31</sup> The field energy includes all energy areas, i.e. fossil fuels and renewables.

<sup>32</sup> Technical and consulting services are defined as activities of limited scope and duration customised to specific clients’ needs (KISR, 2017).

<sup>33</sup> Original research is defined as papers based on research performed in-house and at least partly funded by DDI. The 2014 peer review had asked DDI to focus on such research.

<sup>34</sup> Fluorodeoxyglucose has a half-life of 109.8 minutes and therefore needs to be produced close to where it is used.

<sup>35</sup> Another department – International Relations and Strategic Partnerships manages the international partnerships in general.

<sup>36</sup> The RD was restructured in 2016. Prior to this, it comprised three programmes: the Research Grant Programme, the Environmental Research Program (KWD 653 000 in 2016), and the Water and Energy Program (KWD 200 000) (KFAS, 2016b).

<sup>37</sup> It is, for instance, about 5.5% at the French National Research Agency (ANR, 2017).



**From:**  
**OECD Reviews of Innovation Policy: Kuwait 2021**

**Access the complete publication at:**  
<https://doi.org/10.1787/49ed2679-en>

**Please cite this chapter as:**

OECD (2021), “Higher education and research in Kuwait”, in *OECD Reviews of Innovation Policy: Kuwait 2021*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/f6cee71e-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. Extracts from publications may be subject to additional disclaimers, which are set out in the complete version of the publication, available at the link provided.

The use of this work, whether digital or print, is governed by the Terms and Conditions to be found at <http://www.oecd.org/termsandconditions>.