



مؤسسة الكويت للتقدم العلمي
Kuwait Foundation
for the Advancement of Sciences

STRATEGIC PLAN

2012 - 2016

A Step Forward Towards The Advancement of
Science and Technology in Kuwait



مؤسسة الكويت للتقدم العلمي
Kuwait Foundation
for the Advancement of Sciences

مجلة
العلوم
الترجمة العربية لمجلة ساينتيفيك الأمريكية
تصدر شهرياً في دولة الكويت عن
مؤسسة الكويت للتقدم العلمي



معهد دسمان للسكري
Dasman Diabetes Institute

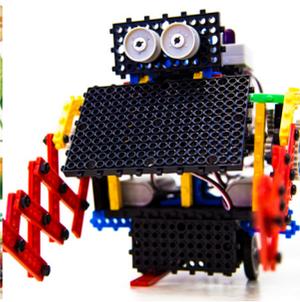
انشأته مؤسسة الكويت للتقدم العلمي سنة 2006
Founded by Kuwait Foundation for the Advancement of Sciences in 2006



مركز صباح الأحمد للموهبة والإبداع
Sabah Al-Ahmad Center For Giftedness & Creativity
أنشأته مؤسسة الكويت للتقدم العلمي سنة 2010
Founded by Kuwait Foundation For The Advancement of Sciences in 2010

المركز العلمي
THE SCIENTIFIC CENTER
الكويت **KUWAIT**

انشأته مؤسسة الكويت للتقدم العلمي سنة 2000
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H.H The Amir
Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah
“Chairman of the Board of Directors -
Kuwait Foundation for the
Advancement of Sciences”



H.H The Crown Prince
Sheikh Nawaf Al-Ahmad Al-Jaber Al-Sabah

Preface

For many years, there has been a profound appreciation of science and education throughout Kuwait's society; from its leadership to its government, and people. Science and education have been sources of great interest and high priority, even back in the days when life was harder and state finances and resources were modest. After the discovery of oil, Kuwait increased its interest and support to knowledge and education. In the 1950's and 1960's modern schools and institutions were found including Kuwait University and Kuwait Institute for Scientific Research.

Establishing Kuwait Foundation for the Advancement of Sciences (KFAS), on the 12th December 1976, fulfilled the pioneering vision and efforts of the late Sheikh Jaber Al Ahmad Al Jaber Al Sabah. His noble call for the private sector to participate with the government in supporting and investing in the scientific renaissance, swiftly and enthusiastically, responded to by them and led by the Kuwait Chamber of Commerce. Since then, KFAS has become an example for constructive cooperation and successful participation between the state and the private sector. While it takes pride in its achievements and contributions, KFAS always strives to improve the efficiency of its work. Therefore, in 2010, under the guidance of H.H. Sheikh Sabah Al Ahmad Al Jaber Al Sabah, the Amir of Kuwait and Chairman of KFAS Board of Directors, and under direct supervision of the board, began to prepare a new strategic plan. The plan was completed with the help of a group of international consultants and local experts covering the next 5 years, starting 2012.

It is designed to enable KFAS to strengthen its position by supporting human capital as well as assisting initiatives that contribute to building a solid base for science, technology and innovation. The plan is based on past achievements and guided by a clear vision for the future of scientific progress in Kuwait.

KFAS strategic plan includes an updated vision, mission, and strategy focused on supporting Kuwait National development plan. It is comprised of a number of existing and new programs organized along the four strategic thrust areas described in this booklet.

The newest addition to the strategic thrusts was introduced to enhance the scientific, technological and administrative abilities of private sector companies; channelling all efforts towards fulfilling the Amir's vision to create a thriving knowledge based economy through building a strong Science, Technology and Innovation (STI) system and culture in Kuwait.

Dr. Adnan Ahmad Shihab-Eldin
Director General
Kuwait Foundation for the Advancement of Sciences

Introduction and Background

Kuwait Foundation for the Advancement of Sciences (KFAS) has a 37 year history of supporting the advancement of science and technology in Kuwait. In 1976, a visionary call by the late Amir of Kuwait, Sheikh Jaber Al- Ahmad Al-Jaber Al-Sabah, then Crown Prince and Prime Minister of Kuwait, was favourably embraced by the Chamber of Commerce and leaders of the economic sector in the country. It resulted in the establishment of the Kuwait Foundation for the Advancement of Sciences by an Amiri Decree on 12th December 1976; stating its mandate as a private non-profit organization devoted to supporting scientific research today. The Foundation's work is overseen by a Board of Directors, chaired by H.H. the Amir, Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah. It is financially supported by Kuwaiti private sector companies who have made generous contributions throughout the years, the contribution is currently set at 1% of their net annual profit.

One of the foremost goals of KFAS is to promote scientific development in the State of Kuwait by supporting scientific projects, the scientific community, and the country's scientific infrastructure.

While much has been accomplished by KFAS and related scientific institutions in Kuwait, there is much still to be sought after. The State of Kuwait has grown rapidly in terms of population and economy, the latter as a result of steadily increasing oil revenues. Today, the public sector accounts for more than 70% of the GDP and employs more than 85% of the national workforce. The consensus among the majority of stakeholders is that this growth is not structurally sustainable in the long run and that alternative national development strategies, based on building a complimentary, efficient and competitive private sector economy, are urgently needed.

Recognizing this need, H.H. the Amir of Kuwait, Sheikh Sabah Al-Ahmad Al Jaber Al-Sabah, commissioned in 2007 a "blue-ribbon panel"; the Kuwait Research Review Panel (KRRP), which was tasked to review the organization and the performance of Research and Development and make recommendations for restructuring and advancing Science, Technology and Innovation (STI) in Kuwait.

The panel presented a number of recommendations aimed at strengthening the overall STI system and culture throughout Kuwait, i.e. improving the capabilities and in some cases redirecting the activities of several STI institutions including KFAS, Kuwait University (KU), Kuwait Institute for Scientific Research (KISR), Public Authority for Applied



**The late Amir H.H
Sheikh Jaber Al-Ahmad Al-Jaber Al-Sabah
at KFAS opening ceremony**

Education and Training (PAAET), National Technology Enterprises Company (NTEC), and the Kuwait Science Club (KSC).

Recognizing its unique role within the national STI system in Kuwait and responding to the recommendations in the panel's report, KFAS conducted an extensive assessment of its historical performance by benchmarking itself against similar institutions in the region and on a global level. KFAS consulted with representatives from its key stakeholders and worked closely with recognized leading international and domestic experts in Research and Development (R&D), policy, and STI evaluation to support this assessment.

Based on the KRRP's recommendations and external assessment and findings in 2009, KFAS management embarked on developing a new strategic plan that would help meet the future needs of Kuwait's STI system. The preparatory steps were carefully designed.

The first step was the evaluation of current situation (status quo), followed by numerous steps like the determination of the basic requisites, identification of the targeted sectors, revision of vision and mission, defining the primary goals of the strategy and the expected results. An examination of the on-going and proposed programs and activities were then made.

Problem and solution trees for each program were carefully prepared and analysed, and the institutional requirements and arrangements to achieve the goals of the strategic plan were identified. The last step was to come up with a set of key performance indicators to measure the degree of success over the years at all levels.

Vision:

“An Effective Science, Technology and Innovation System and Culture, to which KFAS has contributed, that underpins the sustainable development of the State of Kuwait”

This vision statement reflects several important concepts based on the Foundation’s past experience and current philosophy. It is nationally-focused and draws on valuable resources to successfully position Kuwait to compete in a knowledge-based economy in the future.

Mission:

Stimulate, support, and invest in initiatives and human resources that contribute to the building of a strong STI system and culture and fostering an enabling environment. The initiatives include improving public understanding of science; strengthening innovation and research capacity and enhancing the enabling cultural environment; supporting the gifted and talented; translating knowledge into innovation; and encouraging private technology capabilities.



KFAS Headquarters

This mission statement defines KFAS’ role and ambitions driving the strategy outlined below. It primarily redefines KFAS as a funding institution. Given its modest annual resources, when compared to the overall STI funding by public institutions at the national level; KFAS will need to effectively leverage its targeted investments and efficiently execute its role as a catalyst to achieve its goals.

KFAS Strategy (2012 – 2016)

The strategy is a result of intensive consultation through numerous meetings lead by the management team at KFAS and its centers. It reflects the latest thinking on the STI needs of Kuwait, the proper role of KFAS and its centers in meeting part of those needs, and a more systematic approach to formulating and selecting programs for KFAS funding. KFAS programs in the strategy are directed towards contributing tangibly to the development of an effective STI system and culture in Kuwait.

In addition to supporting R&D capacity and activities in priority fields, such as water, energy, the environment, and the development and the dissemination of STI culture, the plan puts further emphasis on STI capacity building of the private sector and strengthening of innovation system.

Strategic Thrust Areas

In developing the strategy, four thrust areas were identified. They address the development and human resource needs of the Science, Technology and Innovation System by leveraging the resources of KFAS and other stakeholders. Distribution of KFAS' available resources was given great consideration to ensure maximum impact.



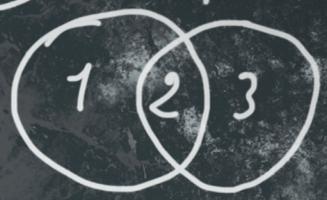
**H.H The Amir Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah
in one of KFAS board meetings**



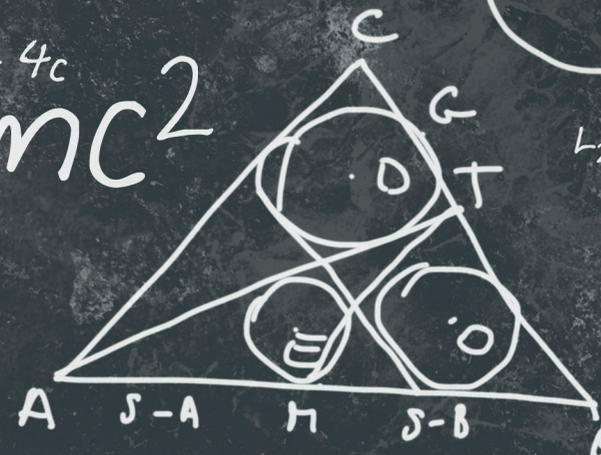
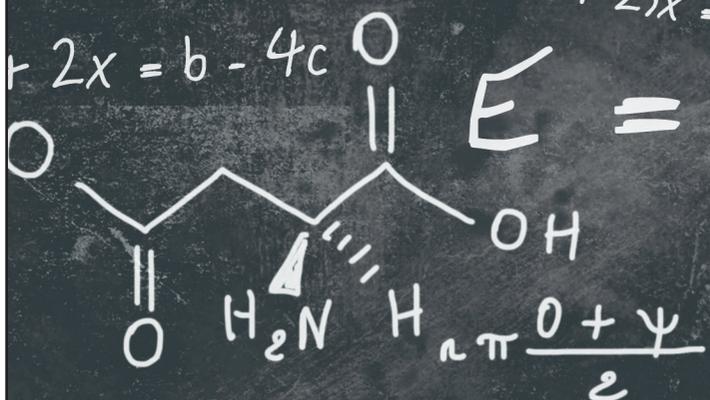
$$D^2 = \frac{1}{p^2} \frac{p_0 - p}{p} \sim \frac{1}{p^2}$$

$$(a + 2)x = b - 4c$$

$$E = mc^2$$



$$\sin\left(\frac{a}{2}\right)$$



$$L_2 = 10 \log \left(\frac{1}{N} \sum_{i=1}^n 10^{\frac{L_i}{10}} \right)$$

$$\frac{v}{I} = R$$

$$z = \frac{\left(\frac{0+\psi}{2}\right)^2 + \left(\frac{1}{2} \log \left| \frac{B}{A} \right| \right)^2}{\int x \sum A(k) dx}$$



$$5(3x - 1) - 7(2x - 4) = 35$$

Advocacy of Scientific Culture

$$7100 \Omega \cos\left(\frac{a}{2}\right) = \pm \sqrt{\frac{1 - \cos a}{2}}$$

$$\tan\left(\frac{a}{2}\right) = \frac{1 - \cos a}{2} = \frac{\sin a}{1 + \cos a}$$

Strategic Thrust 1 – Advocacy of Scientific Culture

Contribute to the development of a strong advocacy for science including science education, support the gifted and talented, and to help advance scientific culture and the enabling environment in Kuwait

The goals of this first strategic thrust are to foster a science and technology culture in Kuwait. This includes advocating and promoting the importance of science and math education, improving STI awareness among the general public, and fostering and developing talented and creative Kuwaitis. There will be an emphasis on the important role of STI in supporting economic development and quality of life. All suitable forms of communication and publicizing will be used to promote STI culture in the society at large.

Key Stakeholders served are:

1. Students and teachers
2. Public sectors
3. General public

Programs and their respective objectives under this first Strategic Thrust area are:

P1: Science and math education:

Encouraging students to engage in science and math education, making science and math more attractive to school children, and facilitating schools and teachers' efforts to improve science and math education.

P2: Engagement in science and technology:

Enhancing scientific knowledge among the public through engaging in science and technology related activities and connecting science and technology to a wider public, especially the youth.

P3: Publicizing and dissemination of scientific technological knowledge:

Enhancing the public appreciation and awareness of science and technology values and introducing science and technology to the society in an attractive and innovative format, with a focus on electronic-content.

P4: Support for gifted students in the field of math, science and technology:

Assisting gifted and talented students realize their full potential in their fields, and helping close the gap between the number of scientists and technologists needed for Kuwait's development and the ones currently available.

The expected strategic outcome of these programs is:

- Achieving greater public acceptance of science and technology and the adaptation of new technological advances. Improvement of teachers' preparation and effectiveness in science and mathematics. Improvement of students' science and math capabilities and achievements. Increasing the number of students pursuing careers in science and engineering, and a greater number of talented and distinguished Kuwaitis.
- Programs in this thrust area are implemented by The Scientific Culture Directorate, while the support for gifted students in the fields of mathematics, science and technology are implemented by Sabah al-Ahmad's Center for Creativity and Giftedness.

This thrust area is implemented by the Scientific Culture Directorate, however supporting gifted students in the field of math, science and technology program is part of Sabah Al Ahmed Center's activities.



**H.H The Amir Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah
honors one of KFAS e-Award winners**



Scientific Research

Strategic Thrust 2 – Scientific Research

Enhance and integrate Research and Development capacity in and among Kuwaiti Scientific Institutions to address national development priorities

KFAS will continue to fund research projects for the various institutions in Kuwait according to its existing research support program. In addition, KFAS will initiate proactive focused programs in areas of national priorities such as water, energy, and the environment. Focused programs under this strategic thrust will favour integrated multi institutional efforts (public and private sector, and international institutions) that solve significant problems, and/or create opportunities for further research and technological applications.

Key Stakeholders served are:

1. Academic researchers of Kuwait University and other private academic institutions
2. Research scientists of Kuwait Institute for Scientific Research
3. Public Authority for Applied Education and Training
4. The Kuwait Science Club
5. R&D Pursuers (public and private sectors)

Programs and their respective objective under this second Strategic Thrust are:

P1: Research grants:

Participating in promoting an effective Kuwaiti scientific research community by increasing Kuwait's research capacity through funding high quality research, and providing a wide range of grants supporting research projects through their various phases.

P2: Environmental program:

Facilitating high quality multi-disciplinary environmental research. This is achieved by advocating and supporting eco-innovative solutions and ecosystem-based management approaches. This acts as a catalyst for the development of a long-term strategic plan for environmental sustainability in Kuwait.

P3: Water and Energy program:

Supporting the development of research capacity in the national research institutions with focus on the priority research areas pertaining to water and energy, by funding research projects that promote the efficient production and utilization of water and energy.

The expected strategic outcome of these programs will be:

- Increased collaboration among R&D institutions and end-users.
- Increased the quality and depth of research projects and the efficiency of the research community.
- Increased the participation of private universities in conducting R&D, which is implemented in collaboration with the Enterprise and Innovation Directorate.
- Enhance industry-oriented research.
- Increased value of research outcomes, which meet national needs, based on the present priorities.
- Aligned KFAS research strategy with national needs.
- Enhanced research capabilities at R&D institutions and other parties.

This thrust area is implemented by the Research Directorate.



Research Directorate Environment workshop

A person wearing a blue, vertically striped shirt is shown from the chest up. Their right hand is extended forward, palm facing slightly towards the viewer. The hand is surrounded by numerous white, semi-transparent gear icons of various sizes, some overlapping the hand and others floating in the air. The background is a soft, out-of-focus grey. At the bottom of the image, there is an orange rectangular banner containing white text.

Innovation in Science & Technology

Strategic Thrust 3 – Innovation in Science and Technology

Support innovation and assist in developing the required links to commercialization within a framework of an integrated Science, Technology and Innovation (STI) system

Under this thrust area KFAS will fund projects and programs that will give Kuwait the ability to commercialize and utilize locally created technologies. Emphasis will be placed on the creation and development of national capabilities that enhance Kuwait's innovation system. KFAS will build on its relationship with universities and renowned international research centers to help generate the best outcome.

Opportunities will be created whereby stakeholders and industrialists will be able to benefit from commercializing intellectual property. Capability-enhancing programs will be introduced to boost technical competitiveness, skilled human resource base and the ability of the public and private sector to understand and absorb emerging technologies.

Key Stakeholders served are:

1. Institutions that support the commercialization of technology and creation of (Small-Medium Enterprises) SME's e.g. investors, banks, and legal communities
2. Institution fostering technology, transfer and integration

Programs and their respective objectives under this third Strategic Thrust area are:

P1: Inventors support:

Creating a support system that stimulates and encourages people to invent and innovate by providing optimal services, and creating awareness that facilitates inventive thinking.

P2: Incubation and support of commercialization:

Creating a platform from which new ventures can mature into new pilot level businesses and projects, and in turn can be funded by venture capital firms or investment companies in Kuwait.

The program will also provide support at the initial development processes from potential concept study all the way to commercialization.

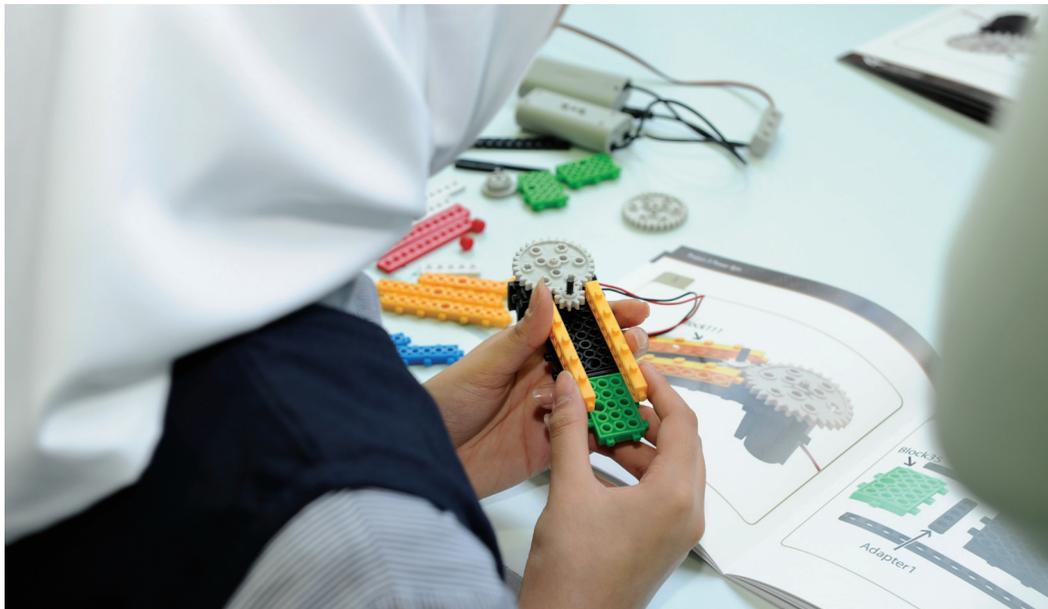
P3: Innovation governance system:

Supporting and guiding a governance framework for innovators, inventors, and entrepreneurs to complement the previous programs.

The expected strategic outcome of these programs will be:

- An integrated functional innovation system and an infrastructure capable of evaluating and supporting the early stages of commercial ventures.
- Frameworks for financial partnerships based on commercial application of Kuwaiti technologies or technologies partnered with others.
- Establishment of new SMEs in Kuwait.
- Participating in the establishment of a Science Park/Technology Center, and Science and Technology incubators.

This thrust area is implemented by Sabah al-Ahmad's center for creativity and giftedness.



A student at one of the creativity classes assembling a robot at one of SAC's workshops



Innovation & Enterprise

Strategic Thrust 4 – Innovation and Enterprise

Supporting the development of the Private Sector’s scientific and technological capacities and participate in building a knowledge economy

This thrust area is managed by a newly established directorate called “Innovation and Enterprise”. It is designed to support the development of the private sector, in particular companies that make annual contributions to KFAS. The foundation aims to contribute to the progression of scientific and technical capacities, improve and enhance regulations, policies, and procedures, develop technology transfer programs, and build innovation and a knowledge-based economy through capacity building.

Key stakeholders served are:

The private sector, with emphasis on small and medium enterprises (SME) as the ultimate users of developed technologies, recognizing their role in creating jobs to build a knowledge-based economy. Particular attention will be given to companies that financially support KFAS.

Programs and their respective objectives under this Fourth Strategic Thrust area are:

P1: Increasing demand and enhancing absorptive capacity:

Providing a platform to build awareness by identifying needs, disseminating information of best practices, and enhancing the STI absorptive capacity and management capability development. In addition the program aims to enhance private and public sector partnership, and commission of specialized studies that can provide general solutions for effective economic policies.

P2: Management Capacities:

Building STI capacity and management capability development through a portfolio of activities, which include direct training, executive and leadership education, local and international staff-exchange, and mentoring and coaching.

P3: Innovation Research Voucher:

Promoting innovation by providing the Innovation Research Voucher (IRV), which offers financial incentives to SME’s and strengthens their links with local and international research centers. This will help promote business development and improve their overall competitiveness and productivity.

P4: Co-Funding of in-house Research and Development:

Promoting STI development by co-funding in-house research and development activities of companies to assist them develop new products and services.

The expected strategic outcome of these programs will be:

- Building an effective and distinct relationships with the private sector
- Providing distinct services to private sector companies
- Building capacities within the private sector in science and technology and modern management techniques
- Knowledge economy, particularly those projects related to SMEs
- Improving scientific and technological content of private sector companies and/or concerned governmental institutions supervising and regulating the private sector

This thrust area is implemented by the Innovation and Enterprise Directorate.

A close-up photograph of a hand in a dark suit sleeve with a light-colored cuff, moving a wooden chess piece. The piece is a king, and it is being lifted from the board. The board is highly reflective, showing clear reflections of the pieces. In the background, other chess pieces like a knight and a pawn are visible but out of focus. The lighting is soft and directional, coming from the side, creating highlights on the hand and the piece.

Cross
Cutting
Programs

Cross-Cutting Programs

Prizes:

The aim of the KFAS prizes program is to support, recognize, and encourage Kuwaiti and Arab scientists and researchers who have made commendable contributions to science. All prizes include monetary contributions presented with a KFAS award as a symbol of appreciation for the valuable efforts undertaken to promote progress in the State of Kuwait.

Following the strategy this program will continue awarding the Kuwait Prize, the Jaber Medical Prize, and the Scientific Productivity Prize. KFAS is open to new prizes in the future.

The Prizes Office administers and executes the program under the supervision of the Prizes Council.

International Programs:

KFAS has established a number of programs with internationally-renowned institutions and universities in the USA, and Europe. These programs are viewed as an important catalyst for the advancement of science and technology transfer to Kuwait and the Gulf region. The programs facilitate close interactions, cooperation, and collaboration between Kuwaiti decision-makers (from the business, academic, and research sectors) and their global counterparts, resulting in better problem-solving practices.

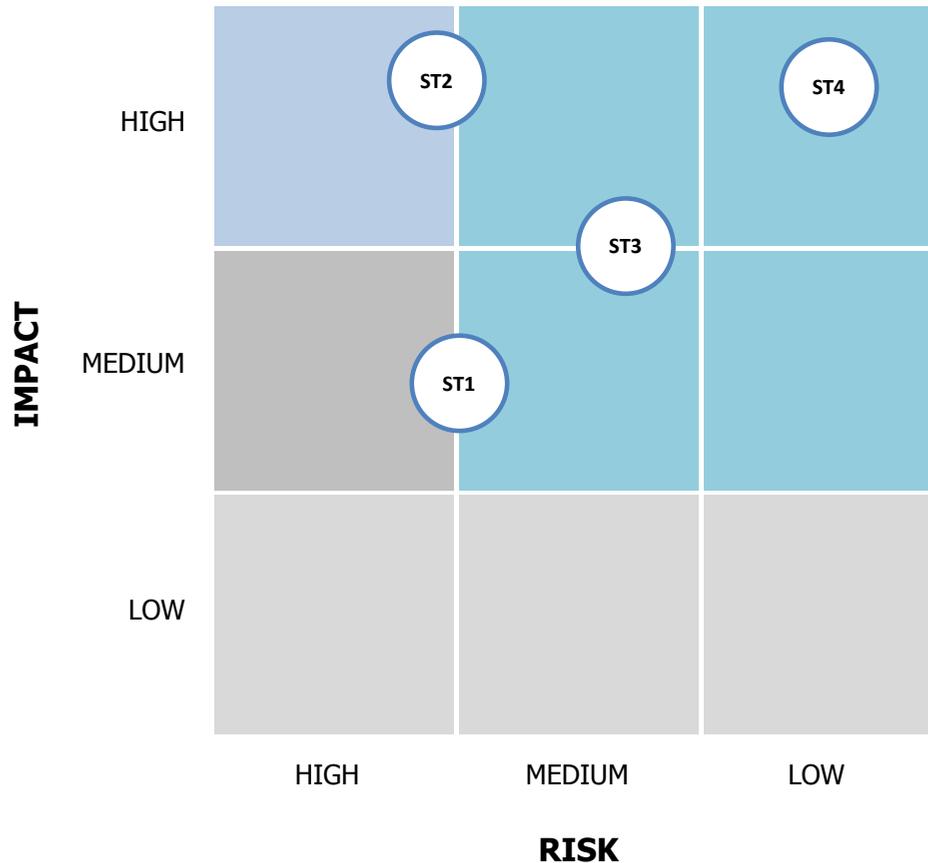
The Office of International Programs (OIP) will manage, follow-up, evaluate, and maintain the execution of the current and new programs and grants. Below are a few examples:

1. Kuwait Program at Sciences Po (The Foundation National Des Sciences Politiques)
2. The Kuwait Program at LSE (London School of Economics & Political Science)
3. Kuwait-MIT (Massachusetts Institute of Technology) Center for Natural Resources and the Environment (CNRE)
4. Kuwait Program at Harvard University
5. Harvard Business School Executive Education

Strategic Thrust Allocation

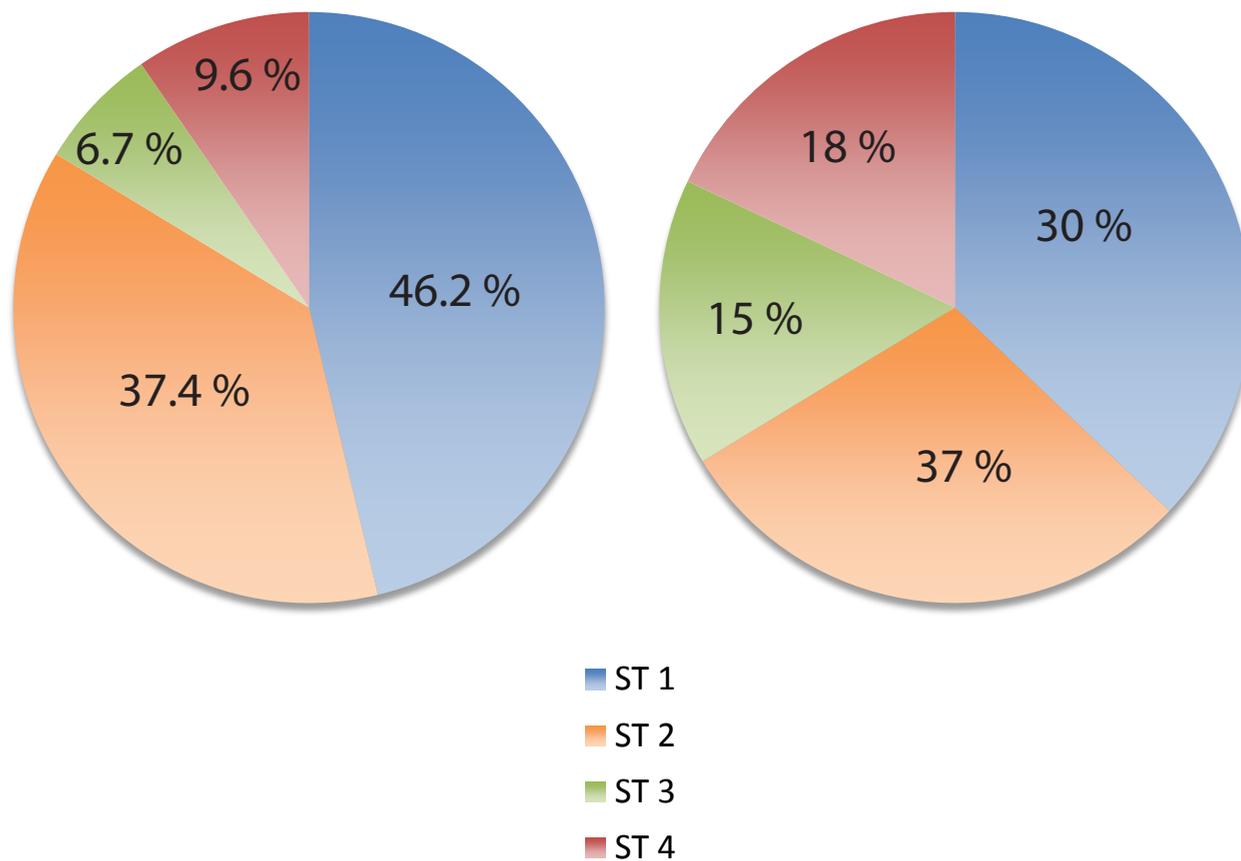
The realization of KFAS's vision and mission is highly dependent on the proper allocation of its resources to its on-going and planned activities under the thrust areas. Once identified, they were prioritized according to the potential impact, and any possible accompanying risk. **Figure (1)** below, illustrates the impact of past funding in each of the thrust areas, demonstrating that ST4 offers the best opportunity for KFAS to influence the STI system in the immediate future and ST2 in the long term. Since ST1 has had many years of funding with great risks, it warrants a fresh approach.

Figure (1): Prioritization of Strategic Thrusts (ST)



To date, KFAS has implemented 45 programs. The strategy reduces these down to a 12 programs in their respective strategic thrust areas, according to their level of priority. **Figure (2-A)** shows the distribution of funding for 2011 in comparison to the proposed future budget allocation according to KFAS priorities.

Figure (2-A): Current Distribution of the Strategic Thrust Funds by Thrust Area



Traditionally, several special projects have been supported by KFAS, and while important, they did not fit well within one of the four strategic thrust areas. These special projects made up 28% of KFAS' budget at the start of 2011, and as such significantly reduced the amount of funds that could be allocated to the programs of the strategy. The budget will now be aligned with the KFAS strategic thrusts, resulting in a reduction from 28% to 10%. These projects will be reviewed and assessed to determine and/or allocate alternative sources of funding, as illustrated in **Figure (2-B)**.

Figure (2-B): Targeted Distribution of Total Funds by Thrust Area

