The German-Egyptian Year of Science and Technology

10 years beyond: History (and stories) of successful cooperation
Once you drink the waters of the Nile, you are destined to return.

Herodotus (c. 486 to c. 430 BC.)
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Preface

On celebrating the tenth anniversary of launching the ‘German Egyptian Year of Science and Technology 2007’ a hindsight look to the past decade gives every good reason for high satisfaction, hence inspiring further ambitions for an even higher standard of scientific cooperation between our two countries.

This cooperation has been always based on the solid platform of mutual respect, common desire of fulfilling the agreements in good faith and finally the strong will to broaden the scope of cooperation on both sides.

At current time the total number of Egyptian students sent to Germany on educational or academic basis across all programs peaked between 1500 and 2000 over the last 10 years. This number is the sum of various programs that deal with education and scientific research with Germany. A considerable amount of the Egyptian students offered to study in Germany are under the direct supervision of the Ministry of Higher Education and Scientific Research (MOHESR), represented by the Egypt Bureau for Cultural Affairs in Berlin.

In addition, the Science and Technology Development Fund (STDF), an Egyptian arm to finance scientific research cooperation with German support, supervises many projects with educational component. The German-Egyptian Research Fund (GERF) aims to provide bilateral research cooperation between the two countries in areas of mutual interest; the grants are intended to give researchers – including young scientists – an opportunity to address new areas of scientific research. Research results generated in these projects are to be developed into concrete applications. GERF is one of the flagship successful projects representing STDF activities, which has been funded around 70 Egyptian-German research projects since 2009 with German partners. Another component of this success is the cooperation agreement with the German Academic Exchange Service (DAAD). DAAD has one of the largest cooperation projects with Egypt, where on yearly basis a considerable amount of post graduate Egyptian students travel under the auspices of our joint agreement to obtain their PhD from German universities.

Through a variety of programmes and projects concluded with DAAD, a considerable number of Egyptian students were enabled to acquire new knowledge and gain life experiences in Germany. These programmes include the German-Egyptian Research Long-Term Scholarship Programme (GERLS) and the Programme for German-Egyptian Scientific Projects (GESP).

There also exist five Master programs concluded between Egyptian and German universities in different multidisciplinary fields, all of substantial importance to Egypt including:

- International Education Management, Helwan University and University of Education Ludwigsburg
- Renewable Energy and Energy Efficiency, Cairo University and Kassel University
- Integrated Urbanism and Sustainable Design (IUSD), Ain-Shams University and Stuttgart University
- Law and Economics, Cairo University and Hamburg University
- Urban Planning, Cairo University, Alexandria University and Cottbus University.
Another pillar of Egyptian-German cooperation is the separate cooperation agreements between certain institutions in both countries. Just to name some, TU Berlin Campus at El Gouna on the Red Sea, exchange of students between Ulm University and German University in Cairo, and the recent opening of Arab German Young Academy of Sciences and Humanities (AGYA) for an office in Cairo.

The joint cooperation between Egypt and Germany has given the University staff and young researchers a real chance to participate in a scientific life, whether academically or practically, preparing them for later duties as professors and scientists in Egypt. Such kind of cooperation has created a network between Egyptian and German universities and scientists that deserves the highest extent of recognition and appreciation.

Celebrating such success of the past provides us with the needed momentum to plan for our future, where I foresee it even more promising. Several projects are expected to take place very soon where cooperation will be enhanced on both horizontal and vertical basis (more new projects including an expected opening of a branch for a German University in Egypt, as well as deepening the existing relationships in terms of programs and research projects).

Prof. Dr. Khaled Abdel Ghaffar
Egyptian Minister of Higher Education and Scientific Research
The German-Egyptian Year of Science 2007: Pioneer of the International Years of Science

Since 2007, the Federal Ministry of Education and Research (BMBF) has regularly organised international years of research with important strategic partner countries as part of its Internationalisation Strategy – with countries with which it already has close relations, but which offer even more potential. Egypt became the first partner country in the “German-Egyptian Year of Science and Technology 2007”, which was followed by Years of Science with Israel, China, Brazil, Russia, South Africa and Turkey.

The aim of the International Years of Science is to strongly build on already existing collaboration in research and education and create broader public awareness of it, in particular to expand cooperation between higher education institutions and research institutions in both countries, to drive forward joint research and promote initial and continuing vocational training. Here, the focus is on global and social challenges.

“Linking Scientific Masterminds”
The first International Year of Science with Egypt was a joint initiative between the BMBF, the German Academic Exchange Service (DAAD) and the Egyptian Ministry of Higher Education and Scientific Research (MOHESR). It was launched in Cairo on 15 January 2007 under the motto “Linking Scientific Masterminds”. The aim was to bring together great minds in order to start joint research projects and promote new scientific talent to strengthen cooperation beyond the Year of Science. This brochure offers examples of just how successful this motto has proven to be to date.

Research for a better future
The themes on which the International Years of Science focus are oriented both to the research agendas of both countries and to the bilateral agreements on scientific and technological collaboration (STC agreements). The focus is shifting increasingly onto future global topics (such as climate/energy, health/nutrition, mobility, security and communication), as well as the promotion of innovation, and with them, the interplay between politics, science, business and society. Ultimately, the goal is to bring together people from different regions who regard the global and social challenges as being an opportunity, and who work together to research and implement possible solutions.

The German-Egyptian Science Year focused on material sciences, water, renewables, biotechnology, health research and the humanities and social sciences. In particular, the collaboration during the Year of Science led to a clearer application focus and increased industrial relevance of the bilateral projects. At the same time, the inclusion of new university and non-university partners in Egypt also created a broader base for cooperation.

Far-reaching successes
Today, as a fitting token of the 10th anniversary, it can be seen just how effectively German-Egyptian collaboration has been strengthened by the joint Year of Science, in particular by the implementation of the joint German-Egyptian Research Fund (GERF). This brochure presents several outstanding GERF projects. Also, during the 2007 Year of Science, DAAD scholarship and research funding programmes, and above all also joint study programmes such as the bilateral “Integrated Urbanism and Sustainable Design” (IUSD) master’s degree at universities such as the German University in Cairo (GUC) or the campus of the Technische Universität Berlin in El Gouna, created excellent structures for the future.

The fact that it has been possible, despite political upheavals, to maintain and fund scientific exchange and to create or further develop structures, is a tribute to the German-Egyptian scientific community, their strong will, their commitment and their flexibility. The plans for the future development of the bilateral cooperation in science and research are described in the Outlook section.
The development of German-Egyptian collaboration in science and research

Germany and Egypt have been collaborating in science and research since the last century. Egypt is still one of the most important partner countries for Germany in the Middle East, forming a bridge between Africa and the Arab world.

The social and global challenges of today are at the centre of the joint research: health, nutrition, climate, water, energy - and increasing capacity on site, as well as innovation and the ability to work. These topics are also firmly anchored in the Internationalisation Strategy of the Federal Government and the Africa Strategy of the BMBF (2014-18; see box).

Egypt is characterised by ecological and climatic extremes, and by economic, social and cultural processes of change. Climate change, water shortages, as well as a decline in arable land as a result of urbanisation and desertification are presenting the country with enormous challenges. Since the 2007 Year of Science, German-Egyptian research teams have increasingly been working on solutions for the secure, sustainable supply of drinking water, food, energy or urban development to the rapidly growing population. Since 2011, Germany has accompanied the political upheavals in the Arab region in the form of a transformation partnership, in order to strengthen civil society and shape the social transformation process in a sustainable way.

Education and research play a key role here. The focus of the collaboration is therefore also the development of local research capacities, the establishment of excellent research institutes and infrastructures in Egypt, improved access to scientific networks and the promotion of young scientific talent. The purpose is not only to build bridges between Europe and the region, but also to enable sustainable development to gain a better foothold within the country itself.

Egypt has one of the longest traditions of higher education in the world. The Al-Azhar University was founded back in 988 by the Fatimids. Today, the University of Cairo, which was founded in 1908, is the largest and most well-known university in the country, followed by the Universities of Ain Shams and Alexandria. With around 50 state and private universities overall, and 2.5 million or so students, Egypt is now regarded as being one of the strongest research bases and in terms of science, one of the most highly developed countries in the Middle East and North-Africa region (MENA).

The key topic areas in Egyptian politics and research include the secure supply of the population with drinking water, food and energy, and the related disciplines such as the environment, health, security and economic and social development. Furthermore, technical and applied natural and life sciences, and in particular, information and communication technologies are being further expanded and systematically supported (see Egypt ITC 2030 http://www.mcit.gov.eg/ICT_Strategy). One declared goal of Egyptian policy is the internationalisation of higher education and research. Germany was already an important, long-term partner before the joint Year of Science.

Germany’s strategies for the internationalisation of education, science and research

No country can successfully face global challenges alone. Here is a brief overview of the goals of the Strategy of the Federal Government for the Internationalisation of Education, Science and Research (Internationalisation Strategy) and the Africa Strategy of the BMBF.
The strategy of the German federal government regarding the internationalisation of education, science and research (2017) defines five goals that provide a focus for action:

- To maintain and increase the excellence of the German science and research system at a consistently high level.
- To develop Germany’s strength in innovation on the international stage.
- To develop the international aspects of vocational education and training and qualifications.
- To involve emerging and developing countries more intensively as partners to shape the global knowledge society.
- To intensify European and international cooperation to overcome global challenges.

source: [https://www.bmbf.de/de/internationalisierungsstrategie-269.html](https://www.bmbf.de/de/internationalisierungsstrategie-269.html)

The Africa Strategy of the BMBF (2014-18) formulates the following goals:

- Overcoming global challenges through joint effort.
- Creating high-quality and sustainable, scientific cooperation structures.
- Strengthening regional and continental collaboration.
- Strengthening innovative potential and developing markets.
- Raising Germany’s visibility in Africa as a key partner in education and research.

source: [https://www.bmbf.de/pub/Afrika_Strategie_dt.pdf](https://www.bmbf.de/pub/Afrika_Strategie_dt.pdf), p. 13

Review: Key bilateral collaboration events prior to the Year of Science

The 10-year anniversary of the German–Egyptian Year of Science presents a good opportunity for taking a brief look back on many years of collaboration. Here are some key events.

Contacts between the two countries date back to the previous century: In 1873, the Deutsche Evangelische Oberschule opened in Cairo; today, it is the largest German school abroad in Africa and the Middle East region. In 1907, the Kaiserlich Deutsche Institut für Ägyptische Altertumskunde, (the Imperial German Institute for Egyptian Antiquity Studies) began its work in Cairo; the Cairo division of the German Archaeological Institute (GAI) is still following the traces of Egyptian history today. In 1951, the German-Arab Chamber of Industry and Commerce opened an office in Cairo, while in 1958 and 1959, the Goethe-Institut followed suit in Cairo and Alexandria.

In 1960, the Federal Republic of Germany and the United Arab Republic signed a cultural agreement designed to provide a framework for cultural and scientific exchange. At that time, topics ranged from support in founding institutes in the partner country and the funding of mobility through to recognition of academic qualifications. Since 1960, the DAAD has been represented with a field office in Cairo, the second-oldest DAAD field office worldwide. At that time, 16 Egyptian students travelled to Mainz for the first time. Today, more than 1,700 Egyptians travel to German higher education institutions with support from the DAAD, with over 450 Germans travelling to Egypt (data from 2015).

Starting in the 1970s, both countries signed several governmental agreements on scientific and technological collaboration (STC). The STC agreements with Egypt in 1979 and 1981, and additional individual and project
agreements from 1980 to 1985 still form the basis of collaboration today. As early as 1974, on behalf of what was at that time the Federal Ministry for Research and Technology (BMFT), the International Bureau (IB) of the former Kernforschungsanstalt Jülich (KFA, or Nuclear Research Institute; now the Forschungszentrum Jülich -FZJ) took over the management of STC with Egypt. Today, the BMBF has assigned the DLR Project Management Agency as the responsible institution.

Since the 1980s, the initial focus on energy research projects, and in particular on nuclear energy research, has increasingly shifted towards environmental research, materials sciences, passive and active solar building, the geosciences and regenerative energy research.

The German University in Cairo (GUC) was established in 2001. It is one of the most successful projects to be initiated as part of the “German higher education institution study opportunities abroad” programme, with financial support from the BMBF and DAAD. GUC founder Professor Ashraf Mansour, who himself was a DAAD scholarship student in Ulm from 1988 to 1992, designed the programme in the same mould as the technical universities in Germany. Today, the GUC, which began teaching in 2003, and which offers 71 programmes of study to more than 12,000 students, ranks among the best private universities in the country. The key subject areas offered are engineering, applied natural sciences, pharmacy and technically-oriented management. The language of tuition is English, while German tuition is obligatory. Since 2006, scholarships have also been awarded from Germany’s Federal Foreign Office.

The GUC is the largest of the binational universities outside Germany; while being in line with the German mentor universities of Ulm, Stuttgart and Tübingen in academic terms, it is subject to Egyptian conditions when it comes to administration, personnel and legal matters. As a result of this structure, it acts as a mediator and bridgehead between the German and Egyptian educational, legal and cultural system. In January 2013, a branch of the GUC opened in Berlin.

In 2007, the first BMBF International Year of Science was organised as agreed between the BMBF and the MOHESR: the “German-Egyptian Year of Science and Technology 2007”. The aim was above all to highlight the breadth and potential of German-Egyptian collaboration, as well as prospects for further scientific cooperation, since the cooperation with Egypt became a model for collaboration with other countries in the region. Additionally, the aim was to make a key contribution to dialogue with the Arab world, in which Egypt plays a key role as a “gateway” between Africa and Asia.

You can find out what the joint Year of Science achieved in the next chapter.
Milestones of the German-Egyptian cooperation
1873  Founding of the German Evangelical Grammar School in Cairo, today the largest German school in a foreign country in Africa and the Middle East region
1907  Founding of the German Archaeological Institute (GAI) in Cairo as the Imperial German Institute for Egyptian Antiquity Studies
1951  Founding of the German-Arab Chamber of Industry and Commerce in Cairo
1956  Establishment of the Egyptian National Research Center (NRC)
1958  Opening of the Goethe-Institut in Cairo and Alexandria (1959)
1960  Cultural agreement between the Federal Republic of Germany and the United Arab Republic, on 16 October 1960
1960  Opening of the field office of the German Academic Exchange Service (DAAD) in Cairo
1980  Agreement between the Federal Republic of Germany and the government of the Arab Republic of Egypt regarding collaboration in scientific research and technological development of 11 April 1979
1982  Agreement between the government of the Federal Republic of Germany and the government of the Arab Republic of Egypt regarding collaboration in the field of the peaceful use of nuclear energy
2003  Founding of the German University Cairo
2007  German-Egyptian Year of Science and Technology
2007  Ministerial agreement on the establishment of the bilateral German Egyptian Research Fund (GERF) and agreements with the Egyptian Ministry of Higher Education and Scientific Research (MOHESR) on jointly funded scholarship and research funding programmes with the DAAD
2008  Founding of the Egyptian Science and Technology Development Fund (STDF)
2008  First call for proposals within the scope of the German-Egyptian Research Fund (GERF)
2009  Opening of an office of the Orient-Institut Beirut (OIB) in Cairo
2010  Second GERF call for proposals
2011  Transformation partnership between Germany and Egypt is launched
2011  Founding of the DAAD Cairo Academy
2011  GERF interim call for proposals in the field of the humanities and social sciences
2011  The German Embassy initiates the Cairo Climate Talks (CCT)
2012  Third GERF call for proposals
2012  Founding of the German Science Centre (DWZ) in Cairo
2012  Establishment of the Berlin campus of the German University Cairo
2012  Opening of the El Gouna campus of the Technische Universität Berlin
2015  Fourth GERF call for proposals
2017  10th anniversary of the German-Egyptian Year of Science
The most important events during the joint Year of Science

Joint research projects and more than 150 events brought the German-Egyptian scientific community together during the Year of Science - and are still having an impact today. One example is the implementation of the joint “German Egyptian Research Fund (GERF)” and scholarship programmes to promote young research talent.

During the “German-Egyptian Year of Science and Technology 2007”, a broader basis was created for scientific cooperation through the involvement of new university and non-university partners in Egypt, for example through the implementation of joint funding and study programmes.

The “German Egyptian Research Fund – GERF”
The BMBF and the MOHESR founded the German Egyptian Research Fund (GERF) in order to create a stable framework for the project ideas agreed during the Year of Science. The research funding programme has been continually developed further since 2008 and constitutes a sustainable basis for the priorities and results of the Year of Science. Junior research groups in particular from both countries are offered the opportunity through the joint funds to implement innovative, application-oriented, industry-relevant research projects. The projects presented in the following chapter provide an example of just how well this has succeeded to date. A further goal of the bilateral research fund is the support of scientific networks when applying for funding from the EU Framework Programme HORIZON2020 or from national funding programmes.

Since the joint funding tool was implemented in 2008, the BMBF and the Egyptian Science and Technology Development Fund STDF have published a total of four joint calls for proposals (2008, 2010, 2012, 2015) in all subjects related to the fields prioritised in the Year of Science – Biotechnology, Medicine, Material Sciences, Water, Renewable Energies, Humanities and Social Sciences – which have in the interim been supplemented by wide-ranging topics of common research interest (see box). Against the background of the social upheavals in Egypt since February 2011, an additional interim announcement of open calls specifically for issues relating to the humanities and social sciences was published, with the aim of further improving bilateral research cooperation in this field. However, due to these upheavals, the response was relatively muted and only one project was funded.

Both sides finance the research fund to an equal degree, with up to one million euros per year respectively overall. Since 2009, Germany and Egypt have funded over 50 joint projects in application-oriented and, to an increasing extent, in industry-relevant research, through the GERF, with a total volume of over ten million euros. A further 22 projects are also being funded to a maximum level of 200,000 euros from mid-2017. These bilateral projects from the fourth GERF call for proposals comprise the focal areas of nutrition safety and climate change, water, renewables, urban planning, traffic and transport studies. This call is also being managed by the DLR-PT together with the Egyptian STDF.

Short- and long-term scholarship programmes promote exchange
The most important results of the 2007 German-Egyptian Year of Science included the agreements with the Egyptian Ministry of Higher Education and Scientific Research (MOHESR) on jointly funded scholarship and research support programmes with the German Academic Exchange Service, the DAAD. Both the German Egyptian Research Short-Term Scholarship Program (GERSS) and German Egyptian Research Long-Term Scholarship Program (GERLS)
for young research talent have since then been co-funded by MOHESR. While the costs of GERSS are shared equally by the Egyptian and German sides (with funds from the Federal Foreign Office in the case of Germany), the Egyptian partner in GERLS is responsible for providing 70% of the costs. As a result, 223 GERSS scholars received support between 2008 and 2016. Thanks to GERLS, the number of Egyptian doctoral candidates has more than quadrupled. While just 18 doctoral scholarships could be paid from German funds before 2008 the DAAD and the ministry have offered up to 81 scholarships of this type since 2009/2010. With investments totalling around 19 million euros over eight years, it has already been possible to cover 436 doctoral candidates through the funding programme.

**Mobility support for young research talent**

Since the joint 2007 Year of Science, there has also been a co-financed programme in the project area: the German Egyptian Mobility Programme for Scientific Exchange and Excellence Development (GE-SEED). The aim is to intensify cooperation between foreign and German research groups who work together on a specific academic project during stays at the partner institute. Here, special consideration is given to the ongoing training and specialisation of young research talent. The GE-SEED programme supported 66 projects from 2008 to 2015.

The funds for implementing these programmes are allocated to the DAAD by the BMBF. On the Egyptian side, the programme is funded by the STDF.

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**Further links:**

For more detailed information on funding opportunities, visit the DAAD scholarship database: https://www.daad.eg/de/stipendiendatenbank/ and on the website of the DAAD field office in Cairo: https://www.daad.eg/en/

Final report of the German-Egyptian Year of Science and Technology 2007: www.bmbf.de/pubRD/german_egyptian_year_of_sience.pdf
Success stories of the German-Egyptian collaboration

German-Egyptian Research Fund (GERF) projects

Since 2009, Germany and Egypt have supported more than 50 joint projects in application-oriented and increasingly also industry-relevant research through the German-Egyptian Research Fund (GERF). We present you five of these projects here.

Focal topics of GERF announcements of open calls to date

GERF I - 2008: 18 projects funded
• Biotechnology and agricultural research, in particular the production of foodstuffs in a polluted environment and with a view to climate change
• Energy savings and renewables, in particular wind turbine technology

GERF II - 2010: 14 projects funded
• Water desalination
• Health research, including the agricultural production of pharmaceutical substances from plants ("pharming")
• Climate and natural resources protection management, in particular the "tolerance of cultivated plants to stress from drought and salt under field conditions"

GERF III - 2012: 19 projects funded
• Nutrition safety, climate change, water, renewables, urban planning;
• Traffic and transport studies, humanities and social studies

GERF IV - 2015: 22 projects funded
• Food production and food safety
• Management of water resources
• Renewable energy
• Environmental research
• Material sciences/nanotechnology: risk assessment/impact on man and environment
• Robotics and mechatronics
• Information and communication technology (ICT)
• Transportation and urban planning
Bank filtration for a safe drinking water supply in Egypt

Find out here just how sustainably an application-oriented research project can contribute to the provision of low-cost, safe drinking water in Egypt in an interview with project manager Prof. Thomas Grischek, who teaches water management at the Dresden University of Applied Sciences (HTW Dresden).

Professor Grischek, you have held a professorship in water management at the HTW Dresden since 2003, and support numerous partners abroad through applied research projects, with a strong use of bank filtration. The same is true in Egypt. From 2011 to 2013, you worked with Egyptian partners as part of a GERF project to examine the opportunities for use of bank filtration. Please tell us more about the background to the project and the goals.

In times of strong clouding of the water in the Nile, or following the entry of pollutants due to insufficient wastewater purification, waste or negative impact, the safe provision of drinking water cannot be guaranteed. Also, due to the population growth in many cities in Egypt, capacities needed to be expanded. Our goal therefore was and remains an increased use of bank filtration to obtain drinking water from the Nile and from Egypt’s canals.

What advantages does bank filtration offer in and for Egypt?

With bank filtration, substances that cause clouding, degradable and highly absorbable pollutants, as well as pathogens and microorganisms, are already removed in the subsoil. This preparation saves on costs for the further preparation of drinking water, and increases safety.

Is this method being successfully implemented in Egypt?

A small number of bank filtrate basins on the Nile have already been successfully in operation for several years, while others have been closed again, since the systems were incorrectly measured or installed, or there were no preparatory measures in place for the removal of iron/manganese from the bank filtrate, which is usually necessary.
What are the preconditions for the efficient use of bank filtration?

Thorough preliminary inspections with regard to the location selected for the well, for the design of the systems and for further water treatment are essential. This is underestimated. For this reason, we have conducted these inspections in an exemplary way in our project. After the positive evaluation of the quality of the Nile water made during the project and of the hydrogeological site conditions in Upper Egypt, we have in particular taken steps to train engineers from the holding company for water and wastewater. Together with the GIZ, we conducted training courses on bank filtration in Luxor in 2014, with 63 participants, and in Cairo in 2015 with 90 participants.

What was the most important event during your project, and what emerged from it?

The scientifically founded assessment of the potential for bank filtration in Egypt. With the related publication (Ghodeif et al. 2016), we have taken the research forward and at the same time created a basis for the water suppliers and ministries making decisions and for further work by the Egyptian research institutions. In the follow-up to the project and the GIZ further training on bank filtration, bank filtration basins were constructed in at least four locations in Egypt. Their successful operation and coupling with a suitable iron/manganese removal system, and acceptance among the population, will be decisive when it comes to building further systems. We presented the advantages of bank filtration to 150 guests in November 2016 as part of the “Germany Days in Upper Egypt”, organised by the German Embassy in Cairo, in a panel discussion of the “Cairo Climate Talks”. 

© HCWW : Depth-oriented sampling to determine the depth distribution of manganese in the bank filtrate on the Nile, Embaba waterworks, Cairo, 17.11.2016
**Very briefly: Bank filtration**

Bank filtration has been used in Germany for 140 years, in order to obtain untreated water from wells immediately next to rivers or lakes. Here, the seepage of the surface water and natural filtration, adsorption and disintegration processes in the groundwater supply line are used to remove impurities in a natural way. This not only reduces the cost of water treatment; when the location is chosen careful, it is also a sustainable and safe method that requires little maintenance.

© HTWD: Application for the GIZ further training on bank filtration, Luxor 2014

© HTWD: Determining the water quality at a test well in Dishna, near Luxor, 26.02.2012

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**Overview: Bank filtration**

**GERF project:** Bank filtration for low-cost water provision under arid conditions  
**Project manager:** Prof. Dr.-Ing. Thomas Grischek, Department of Water Management, Dresden University of Applied Sciences (HTW Dresden)  
**Project partners:** Suez Canal University and the state water supply company, the Holding Company for Water & Wastewater (HCWW)  
**Funding volume:** EUR 93,694 on the German side  
**Duration:** 01.09.2011 - 30.11.2013  
**Website:** [https://www.htw-dresden.de/de/fakultaet-bauingenieurwesenarchitektur/bauingenieurwesen/lehrgebiete/wasservesen/forschung.html](https://www.htw-dresden.de/de/fakultaet-bauingenieurwesenarchitektur/bauingenieurwesen/lehrgebiete/wasservesen/forschung.html)
Increasing the quality of medicinal and aromatic plants

The concept for a German-Egyptian research project to increase the level of active ingredients in medicinal and aromatic plants emerged in 2007 during the joint Year of Science - with far-reaching success for application-oriented research and bilateral collaboration.

How is it that medicinal and aromatic plants grown under Mediterranean conditions have a far stronger aroma and a higher concentration of effective secondary substances than the same plants cultivated in more moderate regions? Is it really the dry stress in arid areas which plays a key part in the increased level of biosynthesis of natural substances, thus increasing the active substance content? A highly interesting question, not only for the science community but also for producers of spices, medicines and perfumes.

To answer this project question, the research team from the TU Braunschweig, together with the National Research Center (NRC) in Egypt, conducted both studies in the greenhouse and field studies with parsley, sage and nasturtiums. They reduced the amount of water given to the plants, or exposed them to moderate levels of stress by gasifying them with the phyto-hormone methyl jasmonate (MJ). In summary: When cultivating medicinal and aromatic plants, the targeted use of dry stress really does improve quality. However, the plant species react differently, so that the respectively optimised culture conditions and post-harvesting methods also need to be recorded.

Long-term cooperation and follow-up projects

"Thanks to our GERF project, we have not only been able to increase the quality of our medicinal and aromatic plants", says Prof. Dr. Dirk Selmar from the Institute of Applied Plant Biology at the TU Braunschweig. "Our research work has also led to a long-term and solid cooperation between the medium-sized partners involved, DRELUSO Pharmazeutika on the German side and FRIDAL on the Egyptian side." But that’s not all. “Our successful collaboration formed the basis for further Egyptian-German cooperation,
such as with the Agricultural Genetic Engineering Research Institute (AGERI), the National Research Centre (NRC) and the Kafr El-Sheikh University. Currently, within the scope of a further GERF project, we are investigating the causes of the frequent contaminations of many plant products with nicotine. This is also a very exciting research topic. We have been able to show that nicotine from cigarette butts enters the soil and is taken up by the cultivated plants”, Prof. Selmar explains. One more issue is important for him: the cultural exchange with Egypt. “It is an opportunity, almost an obligation, to promote dialogue with other cultures!”
Cities and steppes are pushing back field cultivation - not just in Egypt, but all over the world. However, plants are unable to run away. They need to adapt, for example to arid conditions. Just how well they can succeed - thanks to intelligent research and cultivation - is explained by GERF project manager Professor Dr. Peter Nick, Botanical Institute, Karlsruhe Institute of Technology (KIT).

Prof. Nick, you are pursuing important goals with your institute and the GERF project. You are conducting research for the sustainable agriculture of the future. What is the focus of your work?

Sustainable agriculture must protect resources and again take into greater consideration the resilience of cultivated plants against stress factors. Here, it is enough to recognise and use the problem solutions that have been developed during the course of evolution. Plants can very effectively defend themselves against drought and saline soil, unless we have trained them away from doing so through single-sided cultivation with high yields in mind. Our GERF project with the Agricultural Genetic Engineering Institute (AGERI) aims to reactivate the resilience of cultivated plants against dry conditions in order to make cereal farming in Egypt more sustainable.

With the GERF project, you have been able to identify genetic factors in rice which can be used to cultivate improved resilience against dryness. What does the Gen OPR7 have to offer?

With the OPR7, a central switch was identified with which the plant reacts to dry stress using one of two strategies. One is to sacrifice older leaves in a targeted way (survival, OPDA signal). The other is to leave the resources in the older leaves and attempt through cellular adaptation to cope with the dryness (adaptation, jasmonic acid signal).

What strategy is most helpful for agriculture, and how can OPR7 be made popular for use?

From the human perspective, adaptation and not survival is required. In a drought, the farmer can better cope with a reduction in the harvest than with a harvest that is ready only months later, and at different times for different plants. With OPR7, we now have the opportunity to suppress the survival strategy through cultivation, and to keep the plants
in an adaptive mode for as long as possible, so that a harvest is produced (“Yield under stress”, currently a key cultivation goal).

**What long-term effects have you wanted and been able to achieve?**

Now we even aim to look for successful promoters of ORP7 in old local strains of rice or even in wild rice strains, which are able to trigger a fast, strong activation of OPR7. These can then be classically crossed with a locally relevant rice type (referred to below as the target type). After around 5-7 rounds, a “near-isogenic line” is created, where almost all genetic variants from the original target type are contained, but where the OPR7 promoter is present in the effective variant. This method is known as “marker-assisted selection” or “smart breeding”. This has nothing to do with genetic technology - only natural sexuality is used, and no transformation. We are interested in reactivating the adaptability of the old, robust local strains.

Through our research, we are also pursuing a long-term political goal. We are showing by example that genetic diversity among cultivated plants (wild plant relatives, old local strains) is a human asset that is worth protecting. Only if we uphold this diversity will we also be able to make use of it!
Première for solar thermal refrigeration in Egypt

This project was launched in 2012 as part of a GERF project and was developed, designed and assembled as part of a group project at the Fraunhofer Institute for Environmental Safety and Energy Technology (UMSICHT) and the Mechanical Engineering Department / Supply Technology at Assiut University: the first solar thermally-driven refrigeration plant in Egypt.

The North African heat, densely populated urban centres, a high rate of population growth... Egypt’s need for air conditioning in private, public and commercial buildings is growing just as quickly as the power consumption that it entails. Standard, electrically driven cooling aggregates and refrigeration machines consume too much power (or other fossil fuels that need to be imported) and overburden power stations and distribution networks.

Solar refrigeration is feasible

"The only future-oriented option are refrigeration processes operated using regenerative energy sources, with solar energy, which is available at high levels", explains project manager Dipl.-Ing. Peter Schwerdt from Fraunhofer UMSICHT. "That’s why it was our aim, together with Assiut University, to develop and build an absorption refrigeration system driven using solar collectors with hot water. We wanted to show that solar refrigeration is feasible and works". And they succeeded in doing so.

Together with students and young scientists from the mechanical engineering/supply technology department, Fraunhofer UMSICHT developed such a system in order to cool a seminar room. A compact 5 kW adsorption refrigeration machine, produced in Germany, was used, while in the summer of 2012, the system was put into operation. Today, it is still monitored and evaluated using a detailed monitoring system.

"Our know-how in the field of refrigeration technology and renewables combined very successfully with the solid scientific basis and knowledge of local conditions on the Egyptian side", says Schwerdt. "Our project results were the subject of several bachelor and master theses and one dissertation, and were presented..."
at conferences in Egypt and Germany, and even in a TV documentary for the Arab region on behalf of the Federal Foreign Office”.

Valuable reference project

“In order to generate cold, the solar collectors widely used in Egypt to prepare hot water can, as our project has shown, be used to provide an excess of solar heat, particularly during the summer”, explains Schwerdt. “In principle, the technology is simple. It can be planned by local suppliers and built and maintained by trained installers. Several high-quality core components such as refrigeration machines, high-efficiency pumps and controls can be purchased from Europe or produced later in the country with a licence. For this reason, our project is a valuable reference project for our Egyptian partner, the suppliers involved and the installers who put it into practice”.

© Fraunhofer UMSICHT, The project team on the roof of the “Heat Lab” at Assiut University
As part of the A²L Mobilius project, the Technical University of Munich (TUM) and the German University in Cairo (GUC) developed a tailor-made building and residential system for Cairo’s informal settlements. We talked to Dr. Thomas Linner at the Chair of Building Realization and Robotics (BR2) at the Technical University of Munich (TUM) about what constitutes this system and what makes it stand out.

Dr. Linner, what goals are you pursuing with the A²L Mobilius project?

The need for living space in Egypt is huge. Our project aims to develop an innovative approach to urban planning, together with the users, which brings together the urban cycle of living space, work and mobility. Together with our Egyptian partner GUC, we developed a building and residential system for informal settlements in Egypt which can be integrated into the individual living environment.

What does such a system look like?

Sustainable, affordable, scalable. The system consists of adaptable modules that are tailored to each other. The core is formed by a hi-tech unit with the most important technical features of a residential building, the so-called “DPU” (decentralised processing unit). The DPU contains three central subsystems, a system for producing energy, a subsystem for mobility (such as a docking station for innovative, electro-based mini-vehicles) and a subsystem for work-life balance (such as a mini production unit or a mini home office). This unit, in a similar way to a prefabricated house, is incorporated into a building system that also needs to be generated (A²BS: Affordable Adaptable Building System). This in turn is planned in such a way that it can be produced at a low cost on site and is compatible with the local residential structures (e.g. “informal housing”). In this way, the entire system can grow into existing structures, replace them or form the core of new residential units.

Overview: A²L Mobilius project

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<tr>
<th>GERF project</th>
<th>A²L Mobilius project</th>
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<tr>
<td>Project manager: Dr.-Ing. Thomas Linner, email: <a href="mailto:thomas.linner@br2.ar.tum.de">thomas.linner@br2.ar.tum.de</a></td>
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<tr>
<td>Project partners: Technical University of Munich (TUM), Chair of Building Realization and Robotics German University in Cairo (GUC), Architecture and Urban Design Program</td>
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<td>Funding volume: EUR 72,874.80 on the German side</td>
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<td>Duration: 01/02/2015 - 31/07/2017</td>
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<td>Website: <a href="http://www.br2.ar.tum.de">www.br2.ar.tum.de</a></td>
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© W. Nadim, Wherever you look, you’ll find informal residential and workshop buildings in Egypt that don’t abide by the law.
What have you achieved to date?

We have detailed our concept together with the residents living in the area. During surveys and workshops, we discovered what they felt was important: waste recycling, energy generation, the supply of food and the opportunity to work in the area where they lived. Now we face the challenge of adapting the technological support to the required low-tech and low-cost level in order to gain acceptance. Funding and business models for the planned renewal must also be taken into account in all cases, which requires a detailed stakeholder analysis.

What is the special feature of your cooperation?

When we join forces, we can transform social aspects into technical solutions. We will use our expertise, experience in technology and the TUM research centre to introduce a completely new social-technological approach into urban planning. We can also make use of our international contacts. Our partner, the GUC, is strongly involved in the urban planning, which makes it easier to access the necessary information and the residents. Also, the GUC has contacts among the large Egyptian industrial associations. Our project is also making a major contribution towards enriching research and teaching with real-life case studies, and supporting young scientists.
Since 1960, the German Academic Exchange Service (DAAD) has been represented with a field office in Cairo, the second-oldest DAAD field office worldwide. The exchange began in 1960 with a trip to Germany, when 16 Egyptian students travelled to Mainz; today, more than 1,700 Egyptians travel to German higher education institutions with support from the DAAD, with over 450 Germans travelling to Egypt (data: 2015). We spoke to Dr. Roman Luckscheiter, Director of the DAAD Cairo Office since September 2014, about the most important milestones of joint internationalisation.

Dr. Luckscheiter, in 2015, the DAAD Cairo Office celebrated its 55th birthday. What in your view were the most important milestones?

Since 1960, not only has the population in Egypt trebled, but our programme has also grown. It began with scholarships to Germany, followed by bilateral projects. Today, we also have a base in the field of further education and marketing. A key milestone was the German-Egyptian Year of Science 2007, in which several co-financed programmes were agreed, including a long-term scholarship programme, via which the DAAD together with the Egyptian government is able to support up to eighty early-career researchers for a doctoral visit to Germany - also as representatives of a globally-thinking spirit that is interested in dialogue, which develops to the benefit of both countries beyond the political sphere. With the transformation partnerships made possible by the establishment of the DAAD Cairo Academy and the founding of the German Science Centre, scientific exchange intensified further after 2011.

During recent decades, project funding has become a key driver of German-Egyptian cooperation, from summer schools through to bilateral study programmes and major projects. Can you give us a few examples of these?

Particularly visible examples are of course the thirteen bilateral masters programmes currently running, which range from education management, urban planning and archaeology through to medicine, engineering and German as a foreign language, and whose curricula not only comprise the perspectives of both cultures, but above all also deliver practical examples. With the German University Cairo and the campus of the TU Berlin in El Gouna, Egypt also has two major transnational education projects which are in great demand. Through the transformation partnerships, we have also been able to initiate a large number of cooperative projects, which have opened up new prospects for young researchers in particular. Overall, there are currently 58 cooperative projects between German and Egyptian higher education institutions!

How do you intend to expand German-Egyptian collaboration in the coming years, and what contribution could “your” alumni make to German-Egyptian collaboration as pioneers?

With the German Science Centre, which was funded by the Federal Foreign Office from 2012 to 2016, we have been able to help make the potential for innovation from German-Egyptian collaboration highly visible, and in doing so, also create lasting bridges between science and business. Together with the liaison offices of German science institutions - the Freie Universität Berlin, TU Berlin, Technical University of Munich (TUM), Philipps-Universität Marburg, Fraunhofer, the Central Agency for Schools Abroad (ZfA) and the Orient-Institut Beirut are present on site – we as the DAAD field office are working towards bringing together the numerous cooperative projects and contacts which are distributed throughout the country, above all by our extensive alumni network – to create specialist clusters. Here, we can also create interfaces to the German Egyptian Research Fund projects. Following the successful establishment of the Egyptian German Water Cluster, we aim to focus next on the area of agricultural...
sciences, energy and health - always assuming the necessary political support on both sides that we have enjoyed to date. Naturally, we also want to bring more German scientists into the country again. German science is known and admired for its interdisciplinary, application-oriented, critical teaching and research. We want to do justice to this – with our classic support methods, but also as a forum for exchange and with the continuous further development of our portfolio.

DAAD Cairo Academy (DCA)

The DAAD Cairo Academy (DCA) was established in 2011 to bring the wide range of training activities of the DAAD Cairo Office under one roof, and to professionalise and restructure them. The DCA has since supported Egyptian universities and research institutions in their further education measures, as well as in strengthening international cooperation projects. The DCA modules increase the competitiveness of Egyptian researchers when it comes to submitting international tenders, as well as improving the quality of teaching and research here. The DCA modules cover a wide range of different areas, such as the Proposal Writing Workshops on scientific work through to administration and teaching in higher education and soft skills and German studies modules. The DCA also offers training units for the large DAAD alumni network in Egypt, as well as intercultural preparation events for funded German and Egyptian scientists.
IUSD: joint master's programme for sustainable urbanisation

With the first jointly developed master's study programme, “Integrated Urbanism and Sustainable Design (IUSD)”, the universities of Stuttgart and Ain Shams in Cairo have taken on a pioneering role. The goal was and remains to train a new generation of experts and decision-makers who are familiar with the rapid urbanisation process and social upheavals in the countries of the Middle East and North Africa, and who develop integrated solution approaches. We talked to Prof. Dr. Astrid Ley, who as well as being a lecturer on international urban development also manages the IUSD programme on the German side, about how well this has succeeded.

What challenges does urbanisation entail, in Egypt and in the Arab region?

The Cairo metropolitan area is one of the global megacities. Some of the challenges here are representative of those faced throughout the Arab world: the dynamic growth of the city, social and socio-economic polarisation processes, which are reflected in the fragmentation of social space (informal settlements versus “gated communities”), insufficient resources and a large share of young people with few prospects for formal work. Almost half the population of Cairo depends on informal solutions when it comes to obtaining living space and employment. At the same time, relations between the city and the environs play a major role, since Cairo is a major urban centre between the fertile Nile delta (agriculture) and the edge of the desert. In some ways, Egypt is pursuing the concept of urban replanning (such as the new Cairo Capital as a capital city).

How can your study programme contribute towards coping with these challenges?

The core of the IUSD programme is the development of strategic approaches and methods. The aim is to achieve both sustainable and resource-sensitive construction (hi-tech and low-tech) as well as the strengthening of the cohesion of urban society and participative planning. A key feature is the co-production of innovative solution approaches in urban development with civil society. In Cairo, this is clearly reflected in the projects in informal settlements. In Stuttgart, this approach entails designing an inclusive coexistence with migrants and refugees in the urban community, for example.

How has the study programme developed over the years?

The programme of study has enjoyed increasing popularity since it was begun five years ago, which is reflected in the large number of applicants. Since the 4th year of the programme, students from other regions of the world have joined students from the MENA region and Germany. During the winter semester 2016/17, IUSD can be studied as a separate programme (single degree) in Cairo and Stuttgart. The cooperation between Stuttgart and Cairo is here a type of backbone that creates a sense of identity, in order to further develop the principle of interdisciplinary and intercultural exchange, and to work together to further develop learning in a real-life context. With this in mind, the double master's programme of the study programme since the autumn of 2016 is being supported by the programme for development policy-oriented study programmes (EPOS).

What are the job prospects?

Alumni of the IUSD programme work in international organisations (e.g. UN Habitat and United Nations High Commissioner for Refugees (UNHCR)) and development cooperation organisations (GIZ, Engagement Global). IUSD alumni are also active in public service (ministries and city administrations such as Tübingen and Stuttgart) as well as in the private sector. Further important and popular areas of work are non-governmental organisations and foundations (such as Robert Bosch). Also, alumni are strongly integrated in the academic environment, such as in transformative research projects.

Work with refugees in 2015 as part of the Integrated Research and Design Project (IRD) in Stuttgart
Do you have a favourite project that you would like to tell us about?

One special experience was the integrated research and design project (IRD) during the summer semester of 2015 with refugees in Stuttgart. Together with the City of Stuttgart and local civil society actors, such as the Arbeitsgemeinschaft Dritte Welt e.V., students of the IUSD and refugees were together able to create specific meeting places. In Cairo, the same project approach, integrated case study (ICS), was used together with the local population to bring new life and enhancement to the public space in the informal settlement of Istabl Antar with smaller, connected initiatives.

German-Arab master’s programme on renewables: “Renewable Energy and Energy Efficiency”

The English-language further qualification master’s programme, Renewable Energy and Energy Efficiency, in the MENA region (REMENA) aims to train German and international students who have a first academic degree and the relevant professional experience in the field of sustainable measures in the energy sector.

Studying renewables means an intensive examination of different theoretical and practical aspects of technology, business, the law and intercultural issues. The goal of the training is to provide excellent specialists for future projects in the energy sector, with a focus on collaboration with countries from the Middle East and North Africa. Students of the REMENA programme are trained at different locations. Teaching events in the form of lectures, seminars, practical experience and excursions are offered during one semester at Cairo University in Egypt or at the University of Monastir in Tunisia (six months), and one semester at the University of Kassel in Germany (six months). The master’s thesis (nine months) can be written in the MENA region, in Germany, or in another country, if possible in companies or relevant institutions which are involved in wind farms or photovoltaics for producing energy, for example, in thermal insulation in buildings or in energy efficiency studies.

The programme is one of the first of many joint master’s study offers in the focal areas of German-Egyptian/German-Arab cooperation. Through the intensive support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and its German-Arab Master Programs (GAMP) http://gamp-online.net/en/masterprogramme.html network, REMENA works closely with other bilateral master’s study programmes, such as the IWRM (Integrated Water Resource Management), IUSD (Integrated Urbanism and Sustainable Design), EMEA (Economics of the Middle East) and INEMA (International Education Management).

Further information:
https://www.daad.de/deutschland/studienangebote/international-programs/en/?p=d&s=kr&id=3920
http://www.remena.uni-kassel.de/
Very briefly: The IUSD master’s programme

The programme is aimed at graduates of all nationalities from the fields of architecture, urban planning, landscape planning, regional planning and construction engineering, and related specialist fields, who ideally also have initial professional experience.

The interdisciplinary and practice-oriented tuition in English is designed to cover four semesters. For the double master’s programme, the first two semesters are offered in Stuttgart. The third and fourth semesters are organised by the Ain Shams University, with the place of study in Cairo, Egypt.

The programme of study will be funded until the end of 2017 as part of the “German-Arab Master’s Programmes (GAMP)” DAAD funding line, from funds provided by the Federal Ministry for Economic Cooperation and Development (BMZ), the Federal Ministry for Education and Research (BMBF) and the Egyptian Ministry of Higher Education (MoHE). Since the end of 2016, the double master’s study programme has also been supported as part of the DAAD programme for development policy-oriented study programmes (EPOS). For further information, visit http://www.iusd.uni-stuttgart.de/
Outlook

The examples outlined here show what an impact the German-Egyptian Year of Science has had, what issues are being addressed by joint research projects, programmes and institutions, and how much they have achieved. The fact that it has been possible, despite political upheavals, to maintain scientific exchange and to create structures, is a tribute to the German-Egyptian scientific community, their strong will, their commitment and their flexibility. But what are the prospects for German-Egyptian collaboration in science and research? We spoke to the Director-General for International Cooperation at the Federal Ministry of Education and Research, Mr. Volker Rieke.

Mr. Rieke, are there plans for a further expansion of German-Egyptian collaboration?

Against the backdrop of the societal developments in Egypt, the BMBF is continuing its joint activities in science and research in order to strengthen civil society and support the processes of societal change in the long term. Education, research and innovation are important factors for socio-economic change, sustainable prospects and constructive partnerships that are of benefit to both sides. We therefore intend to expand bilateral scientific collaboration in the long term and to initiate further bilateral support mechanisms.

What is the state of play, and what plans do you have for the strategic further development of collaboration?

In May 2016, the eighth bilateral meeting of the German-Egyptian steering committee (GERF) took place in Bonn. It was agreed that from the spring of 2017 a total of 22 bilateral research projects would be funded with up to 100,000 euros by each side for two years. This year, the fifth GERF announcement of open calls is due to be published. We have also discussed the strategic further development of the GERF research programme as well as possible accompanying measures and new funding formats for the efficient use of the research results in order to strengthen research and innovation.

Can you share some of the details about the planned call with us?

Our plan is to announce a PILOT call from 2018 in bilaterally selected focus areas, with obligatory participation from the industrial sector: an “Innovation Programme of Science-Industry Projects” along the lines of a “2+2 call”, similarly to what we have done with other countries. The aim is to promote larger, more cost-intensive projects which will later submit joint applications for funds as beacon projects within the scope of EU funding measures such as HORIZON 2020.
What are you doing in order to make the joint activities sustainable?

By increasing the participation of industry, we aim to strengthen the innovativeness of science and research and to find sensible ways to help our partner country Egypt tap its research and development potential. At the same time, we want to involve the expertise of the alumni of funded GERF projects, the research and intermediary organisations and industrial representatives more strongly in the bilateral steering committee in order to optimize its work and make it more sustainable. We also want to involve German and Egyptian young scientists in joint research projects in a more systematic way.

One last question: What do you have planned still for this year?

We are co-hosting a workshop in November in cooperation with the STDF, the funded GERF projects and German research and intermediary organisations. The workshop will provide an opportunity for all the parties, who have been involved in projects up to now, to engage in a bilateral exchange on specific activities and to discuss the opportunities and challenges of future German-Egyptian collaboration in the field of science, research and innovation. We are also holding a festive event in Cairo around the same time to commemorate the achievements of German-Egyptian cooperation in science and research since the joint Science Year in 2007, so basically to celebrate its anniversary.
Additional links

**BMBF, Middle East and Africa:**

**International BMBF office, country cooperation with Egypt:**

**International cooperation, Egypt country side:**
http://www.kooperation-international.de/en/

**Strategy of the Federal Government on the internationalisation of education, science and research (2017):**

**BMBF action plan “International Cooperation” (2014):**
https://www.bmbf.de/pub/Aktionsplan_Internationale_Kooperation.pdf

**Annual Internationalisation Report 2015: Germany's international collaboration in education and research – Priorities for the Federal Ministry of Education and Research (BMBF) and selected academic organisations**
http://www.internationales-buero.de/media/content/Jahresbericht_Internationalisierung_2015.pdf

**Africa strategy of the BMBF 2014–2018:**

**BMBF brochure “International Years of Science: a model of success for bilateral cooperation”:**
http://www.duz.de/cms/media/uploads/user/379/duzSPECIAL_Internationale_Wissenschaftsjahre_des_BMBF.pdf

**German Academic Exchange Service e.V. (DAAD), country information on Egypt:**
https://www.daad.de/laenderinformationen/aegypten/en/

**DAAD country report Egypt 2016: A brief introduction to the higher education system and DAAD activities:**

**The DAAD Cairo Office:**
https://www.daad.eg/de/

**Contributions to higher education policy 4/2013: German-Arab higher education cooperation: Current situation and recommendations (2013):**
http://www.hrk.de/fileadmin/redaktion/hrk/02-Dokumente/02-10-Publikationsdatenbank/Beitr-2013-04_Deutsch-arabische_Hochschulkooperationen.pdf

**iMOVE, market study on Egypt for the export of professional training and further training (2013):**

**Country information of the Federal Foreign Office on Egypt:**
http://www.auswaertiges-amt.de/sid_B29C577B74C9A4106DC2FA87B2EF07F7/DE/Aussenpolitik/Laender/Laenderinfos/01-Nodes_Uebersichtsseiten/Aegypten_node.html

**LIPortal of the GIZ – country information on Egypt:**
https://www.liportal.de/aegypten.html
English-language links

**Government portal - Egypt**
http://www.egypt.gov.eg/English/Home.aspx

**Global Research Guide, Links to information from the fields of science, technology and innovation with reference to Egypt:**
http://www.global-research-guide.com/main/country/Egypt/General_Information

**OECD Science, Technology and Innovation Outlook 2016, Egypt:**

**German-Arab Master's Programmes (GAMP):**
http://www.gamp-online.net/en/masterprogramme.html

**German Science Centre Cairo (DWZ):**
http://www.dwz-kaire.de/german-egyptian-cooperations

**German University in Cairo (GUC):**
http://www.guc.edu.eg/

**Technische Universität Berlin (TU Berlin) Campus El Gouna:**
http://www.campus-elgouna.tu-berlin.de/home/

**Science & Technology Development Fund (STDF), Ministry of Scientific Research:**
http://stdf.org.eg/

**Academy of Scientific Research & Technology (ASRT):**
http://www.asrt.sci.eg/

**Egypt - EU Science and Technology Cooperation:**
http://www.stip.eg.net/

**Research Development & Innovation (RDI):**
http://www.rdi.eg.net/Pages/Default.aspx

**German-Arab Chamber of Industry and Commerce:**
https://www.ahk.de/ahk-standorte/mena/aegypten/