



Federal Ministry  
of Education  
and Research



German-African Cooperation  
in Education and Research

# The Africa Strategy 2014–2018

Africa as a Partner in Education and Research







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# Cooperation with Africa

The groundwork for the cooperation between the Federal Ministry of Education and Research (BMBF) and its partners in Africa was laid more than thirty years ago. Intergovernmental agreements on bilateral cooperation in science and technology have been in place with the priority countries Egypt and South Africa since 1979 and 1994, respectively. Measures such as the establishment of the German-Egyptian Research Fund were implemented on the basis of these agreements. The partnership with South Africa focussed on the continuing development of cooperation through research projects on topics such as integrated water resources management (IWRM). Since 2000, positive political developments and the increased interest of African partners in science and research have led to collaborations in more and more African countries.

The Federal Government's Strategy for the Internationalization of Science and Research, which was launched in 2008, provided further impetus for cooperation with Africa. It declared the strengthening of cooperation with developing countries a new priority.

The funding provided for activities with Africa by the BMBF and other educational, research and intermediary organizations also clearly reflects these trends.

The BMBF has a positive record of cooperation with African countries throughout the implementation of the Internationalization Strategy. Its successes include

- the expansion of its activities to include 39 of the 54 countries in Africa, with 62% of the cooperative projects originating in the past seven years;
- the establishment of two pillars as a basis for its cooperation.

**I. Research:** Expansion of the existing research focus on the environment to include other research priorities: bioeconomy, health, societal development, resource management, transformation and the cross-cutting topic of innovation.

**II. Education:** the established priority topics and specific individual initiatives target the postgraduate tertiary sector and initial and continuing vocational training in order to

- react promptly and adequately to changes in the transition countries in North Africa;
- intensify cooperation with our priority countries Egypt and South Africa;
- support the move towards modernization of individual countries to become knowledge-driven economies;
- reinforce our cooperation in vocational education and training with emerging economies.

A number of approaches to develop beacons of excellence have emerged as a result of the Internationalization Strategy. These beacon projects serve as role models because they establish structures, are regionally focussed and address global and regional challenges in science and research.



Education and science are also crucial to societal transformation processes such as those taking place in North Africa. Funding scientific support for transformation processes and capacity building in research and technology help promote the shift in society towards democratization and knowledge-based development. The Federal Government's "Transformation Partnership Programmes" include measures to promote education, vocational education and training, and research.

This is in addition to consultations on Africa policy with the Group of Eight (G8) and the Group of Twenty (G20), the Organisation for Economic Cooperation and Development (OECD), the United Nations (UN), in particular with the United Nations Educational, Scientific

## Development of expenditure for Africa

	2005 in m € approx.	2009 in m € approx.	2013 in m € approx.
<b>BMBF</b>	<b>11.9</b>	<b>17.1</b>	<b>50.8</b>
<b>Educational, Research, Intermediary Organizations</b>	<b>24.8</b>	<b>68.1</b>	<b>102.9</b>

### Examples of BMBF Africa initiatives since 2008

The BMBF's funding calls for sub-Saharan Africa announced in 2010 and 2012 support bilateral and multilateral research partnerships and study opportunities. 61 projects receive funding in 24 countries.

Support for cooperation between the Network of African Science Academies and the German National Academy of Sciences Leopoldina to raise the profile of science and research started in 2012.

Participation in multilateral initiatives on the research policy dialogue and the further development of research systems and strategic partnerships in the Mediterranean region (eg in the Euro-Mediterranean Group of Senior Officials in Research and Innovation – EU-Med GSO)

The German-South African Year of Science 2012/2013 addressed the following global challenges: climate change, increasing urbanization, the scarcity of resources, global food security and global health problems. It made it possible to intensify existing cooperation and establish long-term collaborations.



Support for social and political research on regional integration processes between the West Africa Institute of the Economic Community of West African States and the German Center for European Integration Studies (since 2013)

The BMBF signed a declaration of intent on cooperation in vocational education and training (VET) with South Africa's Department of Higher Education and Training in 2013. The aim is to make VET in South Africa more practice-oriented along the lines of Germany's dual system.

and Cultural Organization (UNESCO) and its UNEVOC Centre for Technical and Vocational Education and Training, and the United Nations University (UNU).

The BMBF provides important stimulus within the EU and uses synergies between national and European level initiatives to shape multilateral initiatives<sup>1</sup> in international organizations in coordination with strategic partners. The BMBF is involved in a broad range of EU initiatives, including the High Level Policy Dialogue (HPLD), an institution of the EU-Africa policy dialogue on science, technology and innovation. It is a permanent member of the European-African Secretariat, which prepares the biennial HPLD.

Two highlights of our most recent Africa activities were the BMBF's Africa Days and the EU-Africa Summit. Both events generated a great deal of dynamic development.

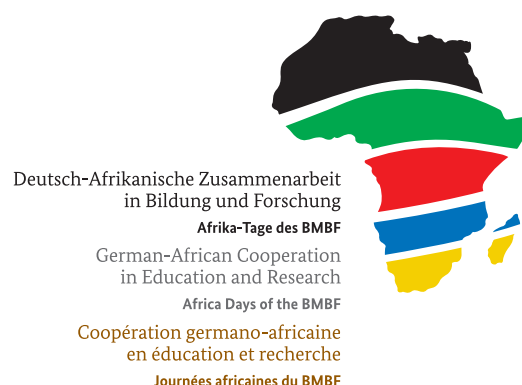
The "German-African Cooperation in Education and Research – **BMBF Africa Days**" took place in Berlin from 16–18 March 2014. The event was attended by a total of 650 participants, nearly 180 of whom represented 38 countries in Africa. On the first two days, about 450 German and African scientists, government representatives and other experts came together in workshops to discuss some of the BMBF's research programmes. The workshops were devoted to specific science and education-related issues and to networking among the experts. In addition to specialist discussions, the workshops also addressed cross-cutting issues. The resulting final document with recommendations was presented to Federal Minister Prof. Dr. Johanna Wanka during the final plenary session on 18 March 2014. The results of the workshops and the recommendations of the experts from Germany and Africa will be taken up in this Africa Strategy.

<sup>1</sup> A few high-profile EU projects are referred to in the following pages.





Dr. Martial de Paul Ikounga, Commissioner for Human Resources, Science and Technology of the African Union, Former Federal President Prof. Dr. Horst Köhler, and Federal Minister for Education and Research Prof. Dr. Johanna Wanka at the Africa Days of the BMBF

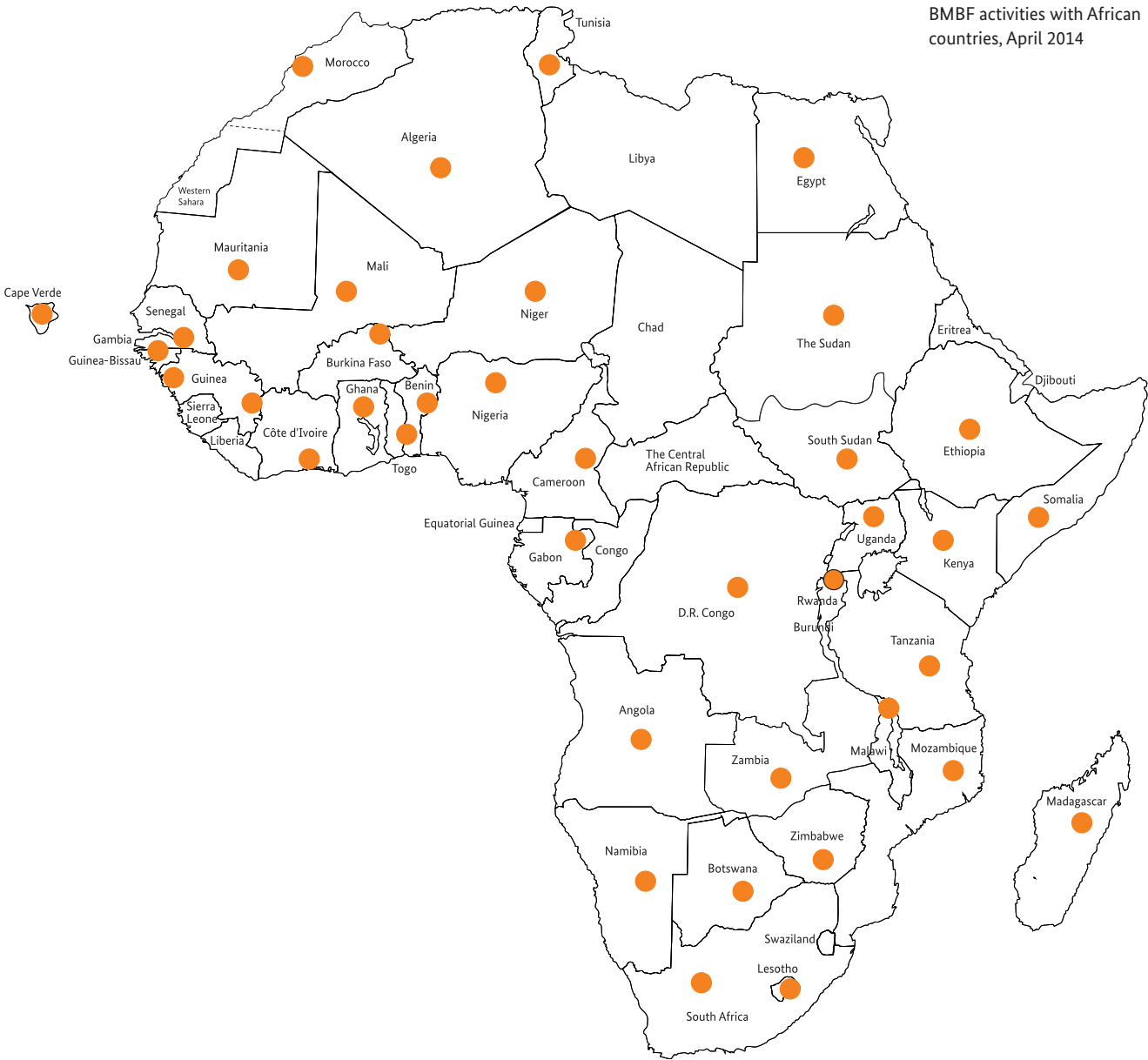


- The high level of interest is proof that education and research are a high priority in German-African cooperation.
- The approach adopted by the BMBF has proven to be on target: previous and current priorities in education and research were reaffirmed and defined in greater detail.
- Partnership in the truest sense: The strategy was developed with the participation of partners on both sides and considers both German and African interests.
- Typically “BMBF” issues are also issues shared by the African Union: The joint summit declarations endorsed a roadmap that sets out science, technology and innovation as a strategic priority and establishes it as a cross-cutting issue.
- German expertise in the priority area ‘food security’: The BMBF actively supported the selection of the future first priority topic “Food security and sustainable agriculture” in the framework of European-African research collaboration. It also ensured Germany’s inclusion in the ten-member group of high-ranking experts from Europe and Africa. This group will present a roadmap for cooperation in the first half of 2014.

The EU-Africa Summit of European and African heads of state and government took place on 2/3 April 2014 in Brussels. The BMBF was strongly involved in the preparation of the summit documents through its participation in the High Level Policy Dialogue and its cooperation with the Federal Foreign Office. In addition to their political implications, these activities may also influence the possibility of receiving funds from Europe:

The following illustrates the activities of the BMBF in African countries.





# Contributions made by German educational, research and intermediary organizations

German educational, research and intermediary organizations have been active on the African continent for many years, some for more than five decades.



**Alexander von Humboldt**  
Stiftung/Foundation

The Alexander von Humboldt Foundation (AvH) promotes scientific cooperation between outstanding international and German researchers. The AvH has provided funding to more than 1,200 researchers from Africa so far. Kenya and Ethiopia were named as priority countries for tapping new potential for the expansion of the AvH network in Africa; however, Egypt, Nigeria and South Africa continue to be the strongest partners in the exchange of scientists with Africa. The AvH considers scientific quality to be the highest priority for cooperation with Africa.

[www.avh.de](http://www.avh.de)

## DAAD

The German Academic Exchange Service (DAAD), whose first office abroad was established in Cairo 52 years ago, and another in sub-Saharan Africa (Nairobi) in 1973, provides broad-based scholarships and cooperation programmes in Africa with funding from a number of different Federal Ministries. The DAAD also operates four information centres, one each in Cameroon, Ethiopia, Ghana, and South Africa. The DAAD defined three courses of action in its Strategy 2020 which will also provide orientation for future Africa activities: Scholarships for the Best, Structures of Internationality and Expertise for Academic Collaborations.

[www.daad.de](http://www.daad.de)

## BIBB

The Federal Institute for Vocational Education and Training (BIBB), which is the centre of excellence for vocational research and for the progressive development of vocational education and training in Germany, supports international cooperation primarily through two initiatives. The Central Office for International Vocational Education and Training Cooperation (GOVET) coordinates the activities of German stakeholders in VET cooperation abroad on behalf of the Federal Government. The GOVET is a key factor in the implementation of the strategy paper on the establishment of a one-stop shop for international vocational training cooperation which the Federal Cabinet, under the leadership of the BMBF, adopted in July 2013. Furthermore, the aim of the iMOVE initiative is to promote international cooperation and to facilitate collaborations and business relations in the area of initial and continuing vocational training. [www.bibb.de](http://www.bibb.de)

## DFG Deutsche Forschungsgemeinschaft

The core responsibility of the German Research Association (DFG) is to award and provide research funding to top-class projects led by researchers at universities and research institutions in a competitive procedure. The two most important DFG cooperation programmes in Africa to date were launched in 2007 in close cooperation with the Volkswagen Foundation: the funding initiative to support German-African collaborative projects in infectology and the "Programme Point Sud" (a workshop series to support North-South and South-South cooperation). In the area of the humanities and social sciences, one of the priority cooperation programmes is "Adaptation and Creativity in Africa - Technologies and Significations in the Production of Order and Disorder". In Africa, the DFG has so far signed cooperation agreements with Egypt (1976), Morocco (1986) and South Africa (1995/1999). [www.dfg.de](http://www.dfg.de)



The **Fraunhofer-Gesellschaft (FhG)**, the largest research organization for application-oriented research in Europe, employs Senior Advisers who support the Fraunhofer institutes and their partners in launching cooperation projects in Africa. The FhG's involvement consists of contract research, scientific collaboration and capacity building and upgrading. The current priority countries of Fraunhofer activities in Africa are Egypt and South Africa. A Senior Advisor has represented the FhG in Egypt since early 2008. Another Senior Advisor was appointed in 2013 to look after the interests of the FhG in South Africa. Exploratory talks and the first cooperation projects have also been launched in North and sub-Saharan Africa. [www.fraunhofer.de](http://www.fraunhofer.de)



As a national research organization the **Helmholtz Association (HGF)** develops solutions to the major challenges facing science, the economy and society. The Helmholtz Association and its Centres are engaged in many strategic partnerships worldwide. The organization has been active in African education and research projects for many years. [www.helmholtz.de](http://www.helmholtz.de)

## HRK Hochschulrektorenkonferenz

Die Stimme der Hochschulen

The increasingly international outlook adopted by Germany's higher education institutions is also leading to more partnerships with Africa. Subject-specific partnerships are the usual form of partnership, where projects are jointly developed at institute or departmental level. The **German Rectors' Conference (HRK)** stepped up collaboration with the South African partner HESA (Higher Education South Africa) and signed a cooperation agreement in 2013. [www.hrk.de](http://www.hrk.de)



The **Leibniz Association** is a network of 89 independent research institutions. The Leibniz institutes cover the entire range of topics from the natural sciences, engineering and environmental sciences to economics, the spatial and social sciences and the humanities. Some of these institutes collaborate with African research partners under cooperation agreements and/or projects. [www.leibniz-gemeinschaft.de](http://www.leibniz-gemeinschaft.de)



Since 2008 the **German National Academy of Sciences (Leopoldina)** has represented German science on international academic committees and presents independent position papers on political and societal issues as part of its science-based policy support activities. The Leopoldina works in close cooperation with the Academy of Science of South Africa, the Network of African Science Academies and other African partners. [www.leopoldina.org](http://www.leopoldina.org)



MAX-PLANCK-GESELLSCHAFT

The 82 **Max Planck Institutes of the Max Planck Society (MPG)** carry out basic research in the natural, biological and social sciences and humanities in the interest of the general public. The various Max Planck Institutes are involved in a large number of projects with African partners. [www.mpg.de](http://www.mpg.de)

### Examples of Africa initiatives

The BMBF's support for the AvH's African-German Network of Excellence in Science (AGNES) is expected to contribute to the debates on educational and research policy.

The overall number of people in receipt of DAAD support within the framework of German-African cooperation is rising consistently. In 2012 the number was 6,293 (of whom 4,279 were in sub-Saharan Africa). Among other things, the BMBF-funded Welcome to Africa project helps to strengthen the Africa expertise of young German researchers as well as to establish and build research collaborations between German and African universities.

The Fraunhofer Institute for Integrated Circuits realized a pioneering project for the entire region with the Digital Media Campus radio at the German University in Cairo (GUC).

The Helmholtz Centre Potsdam - GFZ German Research Centre for Geosciences is working together with other Helmholtz Centres and a large number of African research partners on the INKABA yeAfrica project which aims to understand Earth system processes and their interactions in various spatial and time scales.

Researchers in a BMBF-sponsored pilot project of the INM - Leibniz Institute for New Materials with Namibia are developing adhesives obtained from natural resources and using them to produce sustainable building materials.

There are 414 university collaborations with sub-Saharan Africa and 144 with North Africa (Source: Hochschulkompass, February 2014).

In 2012 the Max Planck Society established its first Max Planck research group based in Africa. The new research group of the Max Planck Institute for Infection Biology is located at the National Research Institute for Tuberculosis and HIV in Durban, South Africa.

The German National Academy of Sciences Leopoldina has been cooperating with the Network of African Science Academies (NASAC) in a BMBF-funded project since 2011. The main goal of this cooperation is to strengthen the African academy network. The cooperation involves the development of knowledge-based recommendations for policy advice for use by the African academies in their dialogue with national and regional decision-makers. A further goal of the project is to create a network of independent top-class African scientists in the fields of water, climate research, health and life sciences.

# Why an Africa Strategy?

## Interest of educational, science and research institutions in Germany and in Africa

The experience of recent years has shown that German higher education institutions, non-university research institutions, intermediary organizations and education providers are very interested in and prepared to engage in cooperation with African partners. Their African partners share this sentiment. The “Made in Germany” brand is more than just a quality seal for German technology products; it also applies to research, education and German education providers working in African countries.

## Taking advantage of opportunities

As diverse as the countries on the African continent are, so too are recent developments. Many countries in Africa have undergone dynamic societal and economic development over the last decade, which is providing ever better conditions for successful cooperation to the advantage of both sides. Countries like China and other states in Europe are also systematically expanding their activities in Africa. African scientists are becoming ever more successful in terms of global excellence in specialist areas of research and science. Many years of trusting cooperation have opened up a broad range of possibilities to further develop education and research for the benefit of both sides.

## A framework for future initiatives

The BMBF's cooperation with African countries has developed rapidly, in particular in the last seven years, and it now provides a reliable basis for strategic planning. Our aim in introducing the Africa Strategy is to provide reliable guidance and a framework of reference not only for ourselves and for the many German research, intermediary and other organizations, but also for European and multilateral initiatives and for our African partners.

## Facts and figures

The average annual GDP growth for Africa as a whole is 4.4%.

Sub-Saharan Africa accounts for just 2% of scientific publications published worldwide (2008 figures) despite a significant increase of 63.4% in the seven years from 2002 to 2008 (Source: UNESCO, 2010).

According to a study by Thomson Reuters carried out in 2010, Germany is one of the top 5 partner countries for research and development with Africa.

The African Union has set an average target of 1% of GDP for expenditure on research and development. Most African countries are still a very long way from achieving this.

The Association of African Universities lists 286 members in 46 countries (Source: AAU, September 2013).

There are now 10.2 million students in Africa, of whom 5.2 million are in sub-Saharan Africa and 5 million in North Africa (2.65 million of these in Egypt).

Africa plays a very insignificant role as a place to study for German students (Source: DAAD/HIS, 2013).

Although the proportion of funded stays in Africa undertaken by German researchers and academics rose steadily from 2.5% in 2005 to 3.4% in 2011 (DAAD/HIS, 2011), it is still very low overall.

African students accounted for 8.1% of all foreign students attending German universities in 2012. Among these, the largest groups are from Cameroon and Morocco (DAAD/HIS, 2013).

### Visibility, Impact and Transparency

The Federal Government's 2011 Africa Strategy set out to raise the visibility of Germany in Africa as a key partner in education and research. The BMBF's Africa Strategy makes practical recommendations on how to achieve this aim. In addition to development cooperation in the conventional sense, the Strategy establishes

new cooperation areas with emerging countries in Africa by applying and involving new tools and players. At the same time it increases the acceptance and impact of German activities in education and research. The Africa Strategy lends transparency to our values, goals and plans in the spirit of open communication between German and African players in research.

## Principles of cooperation

National and international agreements and priorities provide the basis for the German-African partnership in education and research. On the German side, this includes the Federal Government's Strategy for the Internationalization of Science and Research (2008), the BMBF's High-Tech Strategy 2020 (2010) and its further development in 2014, the Strategy of the Federal and Länder Ministers of Science for the Internationalization of the Higher Education Institutions in Germany (2013), the Federal Government's Strategy for Africa (2011), and the guidelines of the Federal Government's policy on Africa (2014). The Strategy takes account of specifically African interests in its orientation towards developments which occur in the course of the strategic partnership between Europe and Africa and under the Consolidated Plan of Action (CPA, 2005) and its

follow-up plan "Science, Technology and Innovation Strategy for Africa" (STISA-2024). All the African states<sup>2</sup> reached agreement on common priorities in science policy under the CPA and STISA-2024. Other pan-African strategies such as the Africa Health Strategy or the Comprehensive Africa Agriculture Development Programme (CAADP) were also taken into consideration. The BMBF gears regional and bilateral cooperation towards the research policies and interests of the respective regions and countries. In addition, a 'bottom-up' flow of suggestions, ideas and recommendations from the German and African researchers – the latest example being the above-mentioned BMBF Africa Days in March 2014 – helps to fine-tune the cooperation.

In its Strategy for Africa of 2011 the Federal Government attaches special importance to education and

### Example of cooperation between German Federal Ministries: research linked to development cooperation

Securing the global food supply is a central aim of the National Research Strategy BioEconomy 2030. The BMBF launched the funding initiative "Securing the Global Food Supply" (GlobE) to support the global development of sustainable, high-output agriculture. 30 German research institutions and 70 African partner organizations in 10 countries are involved in

GlobE. The instruments of the Federal Ministry for Economic Cooperation and Development are additionally available to support the infrastructure at the international agricultural research centres. This provides optimal linkages between new and existing German Federal Government activities in the area of global food supply.

<sup>2</sup> With the exception of Morocco, which is not a member of the African Union.

research with regard to development-related, technical and financial cooperation. A joint agreement signed in 2008 provided a solid foundation for collaboration with the development activities of the Federal Ministry for Economic Cooperation and Development. Links with other policy areas and Federal Ministries (in particular the Federal Foreign Office, the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, the Federal Ministry of Health, the Federal Ministry of Food and Agriculture, and the Federal Ministry for Economic Affairs and Energy) are created through interdepartmental coordination on African issues, for example the preparation of bilateral consultations. Furthermore, all BMBF research and development projects with a total volume in excess of €300,000 are coordinated with other Federal Ministries from an early stage.

In the area of research, the BMBF's main focus is on the jointly defined research objectives. However, support for capacity building and development in our partner countries is also a key accompanying factor, especially because structural weaknesses are endemic in African research and innovation systems. These weaknesses include: low levels of funding for research, a lack of qualified manpower, widespread bureaucracy, poorly developed demand-oriented research, challenges faced in the transfer of knowledge and technology, and little regional and transnational cooperation.

In the area of education, the BMBF is focussing on

networking with the world's (future) best. This is why our initiatives attach special importance to supporting promising researchers creating excellence hubs. The focus of vocational education and training is on the provision of well-founded policy advice which is adapted to local structures.

Autonomy and mutual respect are core values of a reliable partnership. Partnership<sup>3</sup> means acceptance of different interests when coordinating common objectives. The BMBF grants preference to initiatives which are developed in joint efforts and are planned for the long term. We expect of our partners a commitment to shared responsibility, an appropriate contribution to the administrative and financial costs of project execution, and willingness to take on some coordination tasks. Initiatives which aim to make structural changes in particular must already include a sustainable finance plan in the planning phase.

To sum up, the Africa Strategy of the BMBF is based on the following four principles:

- **Creation of added value on both sides through high-quality cooperation and a focus on jointly defined topics**
- **Consideration of country-specific African and German interests**
- **Partnership and autonomy in cooperation**
- **Continuity and reliability in cooperation**

<sup>3</sup> We comply with the Guide for Transboundary Research Partnerships of the Swiss Commission for Research Partnerships with Developing Countries, KFPE.



# Objectives

## Objective 1: Overcoming global challenges through joint effort

**Because the conditions of life in Africa pose great challenges to the world as a whole, the BMBF is helping to find sustainable, global solutions that are of mutual benefit.**

Global population is on the rise, and so is the demand for food, energy, water and other resources. Political systems are in a state of transition. Climate change

calls for adaptation worldwide. The BMBF's research and development projects, scientific dialogues, capacity building measures (eg to create human resources or structures in education and research management), and networking with regional, continental and global partners and other initiatives in education, science and research are helping to develop solutions to global challenges.

## Objective 2: Creating high-quality and sustainable, scientific cooperative structures

**By providing funding to promising young talent and for structure-building, Germany will position itself as a partner of future new science and industry centres in developing countries and emerging economies in Africa<sup>4</sup>.**

High-quality supportive networks in science and industry automatically form around centres of excellence. Investment in these hubs entails not only strengthening their potential and self-help capacities but also building bridges for sustainable cooperation

in research and teaching. The promotion of excellence also advances quality assurance in Africa. The BMBF supports outstanding scientists at all stages of their careers, the collaboration of excellent research teams, institutional networking between German and African universities and research institutions as well as the joint establishment and expansion of research structures. This may occur in the form of individual support from the German Academic Exchange Service (DAAD) and the Alexander von Humboldt Foundation (AvH), through its specialist funding programmes or as part of scientific and technological cooperation.

## Objective 3: Strengthening regional and continental cooperation

**Regional alliances foster the cohesion of societies. BMBF measures support the continued development of regional alliances in Africa and thereby increase the impact of joint initiatives.**

The countries of Africa founded the African Union (AU) in 2002 to strengthen unity and development on the continent. The Regional Economic Communities (REC) act as important links between the AU and the African

member states. The AU implements its programmes through the REC. The BMBF supports the development of regional alliances in Africa by funding regional initiatives in education and research which demonstrate above-average effectiveness and greater visibility. In addition to support for regional alliances, African partners are also interested in networking with partners in other African countries (South-South cooperation and South-South-North cooperation).

<sup>4</sup> In keeping with the Strategy of the Federal Government for the Internationalization of Science and Research, 2008, p. 24.

## Objective 4: Strengthening innovative potential and developing markets

**We want to contribute to prosperity and economic growth in Germany and in our partner countries in Africa.**

Pre-competitive developments are an important basis for innovative products, services and processes in Africa, and they must be promoted and supported. The continued political stability and steady economic growth in many African countries will also open

new opportunities for Germany's industry to further develop its trade and investment relations<sup>5</sup>. Economic prosperity will also lead to security and stability on the African continent. The BMBF applies various formats of scientific and technical cooperation, including cooperation in the sustainable use of raw materials and natural resources, to support the technological development and establishment of emerging markets.

## Objective 5: Raising Germany's visibility in Africa as a key partner in education and research

**Education and research are significant driving forces of economic and societal development in Germany and Africa. Germany will position itself as a reliable and visible partner in the emerging African research and innovation area.**

This objective is also contained in the Federal Government's Strategy for Africa of 2011. The BMBF provides funding to measures which showcase German educa-

tion and research institutions under the umbrella of the "Germany - Land of Ideas" brand. Many research institutions, higher education institutions and businesses are already representing Germany under this brand in Africa. Joint marketing campaigns by the BMBF and stakeholders in education, research and innovation in Germany will be expanded in the future. These initiatives will cover the areas of research and innovation, higher education and vocational education and training.

<sup>5</sup> BDI <http://www.bdi.eu/Subsahara-Afrika.htm> 21.6.2012

## Priority topics

**The topic “environment” in its many facets in the area of research is the longest standing subject of cooperation between the BMBF and Africa, dating back to the mid-1970s. The tradition of strengthening and building human capacities in African partner countries is just as old.**

Three further joint priority focus areas were developed based on the Federal Government’s Strategy for the Internationalization of Science and Research (2008) and in keeping with the African Union’s Consolidated Plan of Action for Science and Technology (CPA, 2005). They are: health, food security and social development. The topic ‘resource management’ and the cross-cutting issues of ‘innovation’ and ‘transition’ have been added. The first two topics are based on the Federal Government’s Strategy for Africa (2011), the German Government’s Raw Materials Strategy (2010) and the African Union’s follow-up strategy to the CPA known as

“Science, Technology and Innovation for Africa” (2013). The topic of transition has emerged in the course of the transformations occurring in North Africa since 2011. Research results supply important services to policy-makers and can strengthen scientific policy advice capacities in Africa. Scientific policy advice will help in efforts to find solutions to social and economic problems which are developed and implemented at local level.

High-quality capacity building is an important part of the majority of BMBF initiatives with Africa. In addition to individual measures, the BMBF and its African partners place special emphasis on structural capacity building and development in order to enable long-term cooperation. The measures also include co-operation in the use of research infrastructure and the use of non-university research institutions for teaching and research.

The thematic priorities are founded on the twin pillars Research and Education.



## Pillar 1: Research

### Priority 1: Environment

The environment is the focus of many bilateral and multilateral research projects. The scope of these projects covers many research areas, which include climate change, ecosystems, water, environmental technologies, biodiversity, the protection of natural resources, earth system science, sustainability in megacities, and many others. As with all environmental issues, they are of global relevance. The BMBF's framework programme "Research for Sustainable Development" of 2009 gets to the heart of the matter: We are assum-

ing responsibility by leading the way in sustainability research in order, among other things, to work together with the rapidly developing region of Africa to develop and realize opportunities that are of a high technical standard and ecologically responsible. Over the last decade in particular, Africa has developed increasing expertise in basic research and applied research on many environmental subjects, which will provide a good start.

#### Examples of "Environment" projects



##### Regional Science Service Centres

The BMBF has started to establish Regional Science Service Centres for Climate Change and Adapted Land Management in Africa together with 15 African partner countries (Angola, Benin, Botswana, Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Mali, Namibia, Niger, Nigeria, Senegal, South Africa, Togo and Zambia). The BMBF will invest €100 million in the establishment and initial operating phase of such centres in West Africa (WASCAL) and Southern Africa (SASSCAL). One of the most important tasks is to train young scientists from African countries. In all, twenty German scientific institutions are involved in the projects under the coordination of the Universities of Bonn and Hamburg.

##### SPACES

The aim of the SPACES programme (Science Partnerships for the Assessment of Complex Earth System Processes) is to carry out scientific cooperation projects in southern Africa which will contribute to the formulation of science-based recommendations for the management of the Earth's system and the sustainable use and protection of the region's various ecosystem services. 63 German research insti-

tutions and 57 African partner organizations are involved in SPACES. This research is supplemented by the "SPACES Scholarships for Post Graduate Studies in Germany" programme, which is run by the DAAD with BMBF funding and enables young scientists in Namibia and South Africa to obtain relevant specialist training. Furthermore, the programme also offers African students training trips on German research ships with experienced scientists.

##### Sustainable water management (NaWaM)

With its IWRM funding measure, the BMBF aims to test, adapt and develop the concept of Integrated Water Resource Management (IWRM) and the necessary transfer of technology and expertise in suitable model regions of a manageable size. The aim is to improve living conditions for people in the model regions. At the same time, we are promoting international cooperation in resource management and strengthening cooperation between science, government authorities and the private sector. The IWRM measure supports research projects in Namibia (CuveWaters) and South Africa (MOSA) for example.

<http://www.cuvewaters.net/Home.5.0.html>

<http://iwrmsouthafrica.de>

## Priority 2: Health

Germany has undertaken to increase its international commitments in the area of health on many occasions. Cooperation with African countries in health research will make it possible to use synergies for the sake of medical progress and, through joint responsibility, to develop specific solutions in health care in the partner countries. The BMBF funding concept for “Neglected and Poverty-Related Diseases” of 2011 provides the necessary framework. The Africa Health Strategy (2007-2015) highlights the importance of health research in Africa.

The BMBF is investing in science partnerships with African countries and is helping the partner countries solve major challenges. At the same time, German research institutions are to be given an opportunity to engage in joint research with African partner institutions on important topical research issues and compete with these against the world's best.

Research networks for innovations in the health systems of sub-Saharan Africa will be developed or expanded as of 2015.

### Examples of “Health” projects



#### EDCTP – European and Developing Countries Clinical Trials Partnership

The BMBF participates in this European-African initiative which focuses on the clinical development of drugs, vaccines and diagnostics to fight HIV/AIDS, malaria and tuberculosis. 45 sub-Saharan countries are partners on the African side. Up to the end of 2013, the EDCTP's total budget was approx. €600 million, of which Germany contributed €60-€70 million (approx. €40 million via the German “contributions” to the EU budget and €20-€30 million via co-funding from the BMBF). The programme is to be continued until 2014 with an expanded focus on diseases and significantly increased commitment.

#### PDPs – Product Development Partnerships

Low spending power in many African countries and massive underfunding of the health systems mean that there are few incentives for the private sector to market products specifically for people in these countries. As a result, there is a lack of suitable drugs and vaccines. The BMBF is providing €20 million in support of Product Development Partnerships between 2011 and 2014 in order to specifically promote the development of low-cost prevention methods, diagnostic procedures and drugs. PDPs are non-profit organizations. They are usually organized as a network of public and private funding providers, research institutions, small and medium-sized enterprises, pharmaceutical companies and NGOs.

### Priority 3: Bioeconomy

Africa has a strong but very traditional basis for bioeconomy in Africa. That basis is agriculture, forestry and fisheries. The agricultural sector in Africa generates about 40% of GDP and is thus key to its development.<sup>6</sup> Becoming a broad-ranging, science-based bioeconomy which includes the use of biomass as a material and a source of energy can help to bring sustainable growth to the continent. Securing the food supply in the long term will remain a major field of action in the realization of sustainable bioeconomy in Africa. Many African countries are showing signs of increasing competition between the production of biomass for various types of use. Any conflict in this context must be mitigated. In

addition, the effects of climate change are also shrinking arable land areas. Countries in which the food situation is already unstable are particularly affected. The African Union declared 2014 as the year of agriculture and food security in order to implement further measures. The “High Level Policy Dialogues”, an institution of dialogue on science, technology and innovation between European and African states, identified the topic of food security as the first priority topic of cooperation. The BMBF played a significant role in establishing this priority. The long-term objective is to develop an African-European partnership within the global bioeconomy.

#### Examples of “Bioeconomy” projects



##### **GlobE – Global Food Security**

The GlobE funding initiative includes research projects that are tailored to local circumstances and which the regional partners in Africa consider to be necessary and sustainable. The initiative is open to all technologies and supports both existing networks and the establishment of new partnerships. 30 German research institutions and 70 African partner organizations in 10 countries are involved in GlobE.

The BMBF is making approx. €42 million available for this initiative and is being supported with an additional €2.4 million from the German Federal Ministry for Economic Cooperation and Development (BMZ) to enable the participation of the international agricultural research centres in Africa. Thus, GlobE is also an example of how different German Federal Government funding instruments work together.

<sup>6</sup> cf German Development Institute: Briefing Paper 1/2011



#### Priority 4: Societal development

The humanities and social sciences in particular reflect the development of a society. These disciplines provide a wealth of knowledge on cultural, economic and historical development as well as on social structures. They thus make a meaningful contribution to decisions on current problems and challenges. At the same time, the need for well-founded knowledge about other regions around the world is on the steady rise. The demand for expertise in the humanities and social sciences goes beyond the provision of short-term advice. Germany must systematically build up its expertise in area studies of the world's different regions if it is to keep up with the

process of globalization and remain competitive. The BMBF is also supporting this task under its funding initiative “Strengthening and Advancing Area Studies”.

The humanities and social sciences could play a key role by providing socio-economic supporting research in topics with a focus on the natural sciences (environment, health, bioeconomy, resource management/raw materials). The translation of research results into practice can only be successful if social, cultural, and economic background environments have been researched adequately and are taken into consideration in the implementation process.

#### Examples of “Societal Development” projects



##### WAI – West Africa Institute

The BMBF supports this initiative of the Economic Community of West African States (ECOWAS) for research excellence on regional issues in West Africa. The knowledge-based contributions serve as a basis for government policy decisions in West Africa. Germany's project partner is the Center for European Integration Studies (ZEI) in Bonn.

##### Strengthening area studies

The BMBF supports the methodological and specialist excellence of, for example, the African area studies being drawn up by two specialist centres at the Universities of Frankfurt and Bayreuth. German and African researchers are working together on these, addressing humanities and social science issues in comparative, inter- and trans-disciplinary perspectives.





### Priority 5: Resource management/Raw materials

Africa is a continent rich in raw materials which have great potential to help achieve economic prosperity in the source countries. Raw materials are one of the priority areas of the Federal Government's Strategy for Africa: "Broad-ranging cooperation and raw materials partnerships, as agreed in the German Government's Raw Materials Strategy, can secure Germany's supply of energy and raw materials while increasing the state revenues of the countries supplying materials and modernizing Africa's infrastructure and economy."<sup>7</sup> We are receiving an increasing number of enquiries from our African partner countries about resource efficiency or innovative ways

to use the raw materials locally. However, there are still many unanswered questions in this context, especially in the area of applied research. A number of pilot projects in this area have been carried out with success. The BMBF therefore plans to foster the development of this still new priority area of research in resource management/raw materials. We on the German side can draw on our experience in mining as concerns environmental protection, safety and labour conditions as well as in the area of initial and continuing vocational training and applied research to help produce solutions, perhaps in the context of raw materials partnerships.

#### Example of a "Resource Management/Raw Materials" project

##### **EffSAFound: Improvement of energy efficiency and recycling in South African foundries**

The aim of this project, which started in 2013, is to increase the energy and material efficiency of South African foundries. This will bring considerable benefits in the areas of climate protection and resource conservation as well as economic benefits for South African foundries and German foundry equipment

suppliers. The participating German companies are small or medium-sized and aim to expand their range of products and services and to add new international markets. The project is being carried out by four companies in Germany led by IfG Institut für Gießereitechnik gGmbH in cooperation with three South African companies and three foundry organizations.

<sup>7</sup> Federal Government's Strategy for Africa, p. 15, 2011



## Priority 6: Cross-cutting issue “Innovation”

More and more states in Africa have established political stability and enjoy high rates of economic growth. Cooperation will grow along with development in these states and thus support the positioning of our programmes. Our African partner countries have demonstrated a great interest in the commercialization of research results. Above all else, it is important to consider society's interests and how research can help to improve living conditions. There are some weaknesses in the links between research and industry and in the communication with governments and society. These weaknesses must be overcome through

joint initiatives which are adapted to the specific needs of the partner country. One means to achieve this is by providing targeted systemic advice on innovation policy or engaging in innovation dialogues. Germany's interest in the innovative potential of products and services which result from joint research projects is based on the following guiding questions: Where is there innovative potential? In which areas does it make sense to join forces with German industry and how can cooperation take shape? Can any links be made to the Federal Government's High-Tech Strategy 2020?

### Examples of “Innovation” projects

#### Analysis of innovation systems

The BMBF in cooperation with its counterpart ministries in Botswana, Namibia and Zambia commissioned studies of the innovation structures together with recommendations for action. These were carried out by VDI/VDE Innovation und Technik GmbH with partners in Namibia, Botswana and Zambia.

In 2013, an analysis of the Tunisian innovation system was undertaken as part of Germany's Transformation Partnership with Tunisia.

The DLR Project Management Agency carried out an analysis of cluster and network structures in North African countries as part of the European MED-SPRING project in 2013.

## Priority 7: Transformation

In particular against the background of the changes which have been taking place since 2011 in the societies of countries across North Africa, the BMBF will be expanding and intensifying its activities in education, science and research with partners in the region. The aim is to provide sustainable support for the transformation process and to strengthen civil society. Education, research and innovation are precisely the factors which are vital for socio-economic transformation, for creating sustainable prospects and for constructive, mutually beneficial partnership. Besides topics related to applied research, there will be a greater focus and involvement in the humanities and social sciences. Joint research on innovation processes, on the role of information and communication technologies in educational matters as well as on aspects of regional cooperation can thus contribute to the development towards knowledge societies.

To varying degrees, all the countries in transition in North Africa have fundamental structural weaknesses in their respective innovation systems as concerns demand orientation, governance and infrastructure.

Existing bilateral cooperation instruments will be complemented by systemic counselling measures to address this particular problem. Regional and transnational activities will be added to those which adopt a bilateral approach. These activities also occur under EU initiatives such as the Euro-Mediterranean Group of Senior Officials in Research and Innovation (EU-Med GSO), a high-ranking group of representatives from the ministries responsible for education and research in Europe and Mediterranean states. The BMBF plays an active role in this initiative.

As a result of the objectives and topics identified above, the priority topic “Transformation” is featured in both Pillar 1 “Research” and in Pillar 2 “Education” below.

### Examples of “Transformation” projects

#### Transformation workshop

One of the first exchanges of project ideas and thematic fields took place at the transformation workshop held in Cairo on May 2011. One outcome was an announcement of a call for proposals under the German-Egyptian Research Fund (GERF).

#### EU projects

The main aim of the BMBF’s involvement in the European Union’s BILAT projects with Egypt and Tunisia is to support the transformation processes in those countries.

#### Transformation Partnerships of the Federal Government

Under the “Transformation Partnerships” which were launched in 2011, Germany supports socio-political and cultural transition processes. The BMBF has contributed numerous ideas for projects in the field of education and research. It is currently cooperating with the German Federal Foreign Office via the German Academic Exchange Service (DAAD) on a general survey of the education market in Tunisia and a project-based exploratory visit and feasibility study for a German-Tunisian university.

## Pillar 2: Education

Promoting and supporting talented young people and excellent young research talent are priorities in education at the tertiary postgraduate level. The aim of the BMBF and the German intermediary organizations DAAD and AvH is to turn 'brain drain' into 'brain gain'. One way of achieving this aim is to apply international standards when German research chairs are established in Africa. This ensures that renowned African researchers have an incentive to bring to bear their qualifications – often acquired abroad – in their own countries and thus promote development in the region. Particular attention is devoted to supporting equal opportunities for African women in science.

The BMBF is part of a political dialogue with countries from all over the world in the Bologna Process with the aim of promoting the modernization of higher education. It encourages the African states to seek this dialogue and to be an active participant.

The BMBF supports the efforts of African states to develop a higher education and research area in Africa.

Structural capacity building is reflected in regional and pan-African initiatives such as the Service Centres for Climate Change and Adapted Land Management

and their attached graduate schools, the German research chair initiative and "Research Networks for Health Innovations". German university study courses abroad promote local capacity building as well as new collaborations in teaching and research, while raising the profile of Germany as a place to study. The most outstanding example of this is the German University in Cairo (GUC).

The BMBF is focussing its activities on the integration of practice-oriented training modules in the education systems of African countries which have the basic necessary economic structure. However, there are no prospects for a market for German education exports in many African countries, even in the longer term. In the meantime, a system of providing systemic advice on vocational education and training at political level will be developed. This long-term development goal is part of the collaboration with UNEVOC, UNESCO's International Centre for Technical and Vocational Education and Training. Local centres of expertise oriented towards the topics "Youth and Skills" and "Greening TVET" will be developed to link up with the potential and needs of local populations. The UNESCO's global structures also serve to advertise the importance and potential of vocational education and training.

### Examples of "Education" projects



#### **AIMS – African Institute for Mathematical Sciences**

Mathematical skills are one of the key areas of importance for the BMBF's collaboration with Africa. The BMBF supports a research chair at AIMS-Senegal. The AIMS – Next Einstein Initiative plans to set up 15 such institutes in Africa. They will provide high-level training for top African postgraduates in mathematics as well as in statistics and IT. The project is being implemented by the Alexander von Humboldt Foundation (AvH) in cooperation with the German Academic Exchange Service (DAAD). The BMBF is planning to establish further research chairs under a pilot scheme entitled German Research Chairs.

#### **Training occupations in Egypt**

One part of Germany's cooperation with Egypt in the area of vocational education and training is a

pilot project at the German-Egyptian University in Cairo. A vocational training course in mechatronics has been offered there since October 2012. This is linked to the possibility of gaining a bachelor's degree in automotive mechatronics. The project is being implemented for the BMBF by the German Office for International Cooperation in Vocational Education and Training (GOVET) at the Federal Institute for Vocational Education and Training (BIBB).

#### **Vocational training processes**

The vocational training processes supported by the BMBF in its cooperation with UNEVOC are concerned with sustainability at all the levels of economic development ("Greening TVET") and serve to promote greener practice.

# Tools

The BMBF has a well-equipped “toolbox” for its cooperation with African partner countries in education and research. These tools include

- **intergovernmental agreements (eg on scientific and technical cooperation)**
- **project funding (eg as part of joint calls for proposals),**
- **individual funding (eg within competitive procedures),**
- **support for higher education institutions or cooperation in higher education (eg German research chairs abroad or bilateral universities),**
- **systemic advice (eg to support vocational education and training or twinning measures),**
- **strategic instruments (eg country or regional strategies, exploratory visits),**
- **networking tools (eg multilateral cooperation agreements), and**
- **marketing tools (eg Science Years).**

Beyond the political level these projects and initiatives in education and research are usually implemented by science and educational establishments in both Germany and Africa:

- **The expertise of the researchers and education professionals involved provides the platform for cooperation.**
- **The collaboration of experts leads to the desired results. The way in which scientific goals are achieved depends on mutual needs; working together on a common topic takes priority.**
- **The shared understanding of a specialized subject creates trust and can facilitate structural adjustments in research or education management.**
- **Coordinated action between education and research institutions ensures coherence and critical mass.**

Furthermore, as far as administrative and organizational support for projects is concerned, the BMBF as a rule works together with project management agencies which specialize in education and research. One such organization is the project management agency German Aerospace Center/International Bureau of the BMBF (PT-DLR/IB). The IB has decades of experience in the administrative management of BMBF projects and

initiatives and enjoys a high degree of visibility in the scientific community. The BMBF also works on projects together with other Federal Government implementing organizations. These include the Reconstruction Loan Corporation or the Gesellschaft für internationale Zusammenarbeit (GIZ) and its Centre for International Migration and Development.



## Our goals for the next five years are ...

... to work together with our African partners in order to

- **increase support for the efforts by German stakeholders in education and research to build and develop excellent institutions which make use of regional synergies. This is to make initiatives more widely accessible, to enhance expertise and networking and to increase financing and visibility;**
- **develop measures which enable German higher education institutions, research institutions and businesses to work together with their African partners in scientifically promising countries of Africa in close collaborations which are sustainable and focussed on problem-solving;**
- **systematically incorporate innovation and market potential in our collaborations and thereby add a new dimension to cooperation with the countries in Africa. The aim is to secure the future, to realize the market-oriented commercialization of research results and to improve living conditions;**
- **further strengthen capacity building in the research and education landscapes of the partner countries for the purpose of establishing sustainable, reliable and quality-oriented structures for cooperation;**
- **act in the name of science diplomacy and offer education and research as a means to further stabilize the countries and regions of Africa;**
- **make use of the European perspective and shape bi-regional initiatives together with our partners.**

In three years' time we will carry out an evaluation of the measures to implement this Africa Strategy and report to the German Bundestag. Based on the results of the evaluation we will decide on the continuation and/or modification of the Africa Strategy.

The following measures are planned to implement these goals:



## Annex: List of planned measures

Measure	Description/Comments	Objectives <sup>8</sup>	Priorities
North Africa			
1. Development of a strategy paper to support the systematic development of societies by means of education and research	BMBF strategy paper on cooperation in education and research for North Africa and the Middle East taking particular account of the countries in transition	1, 2, 3, 4, 5	Transformation, may concern all the priorities
2. Enhancement/intensification of bilateral research cooperation with Morocco and Egypt	Expansion of project funding through regular calls for proposals with varying thematic focuses. Increasing the inclusion of industry, particularly small and medium-sized companies in project support. The political coordination process with the representatives of the governments of Morocco and Egypt is already underway.	1, 2, 4, 5	May concern all the priorities
3. Enhancement/intensification of bilateral research cooperation with Tunisia, discussions on establishing a German-Tunisian university	As above. Here too, the political coordination process with the representatives of the government in Tunisia is already underway and will be intensified as part of the German-Tunisian state-secretary consultations in 2014.	1, 2, 4, 5	Transformation, Education, may concern all the priorities
4. Intensification of cooperation with the Mediterranean countries of North Africa within the framework of multilateral initiatives such as the EU-Med Group of Senior Officials, for example to draw up a European-Mediterranean agenda for innovation	As part of EU initiatives; examination of other possibilities	1, 2, 3, 4, 5	Transformation, Innovation, may concern all the priorities
5. Pilot measure at the German University in Cairo: Prepare training programme for automotive mechatronics	The programme will include the possibility to obtain a bachelor's degree in automotive engineering as part of a dual study programme. The project is being implemented for the BMBF by the German Office for International Cooperation in Vocational Education and Training (GOVET) at the Federal Institute for Vocational Education and Training (BIBB).	1, 5	Education (here: Vocational Education)
6. Establishment of practice-based vocational training structures for defined occupations in Algeria	The Algerian education ministry has proposed the signing of a memorandum of understanding (MoU). The MoU will be drawn up in consultation with the German-Algerian Chamber of Commerce and Industry in Algiers as well as with representatives of German industry in Algeria.	1, 5	Education (here: Vocational Education)



Measure	Description/Comments	Objectives <sup>8</sup>	Priorities
<b>Sub-Saharan Africa</b>			
7. Establishment of research networks for health innovations in sub-Saharan Africa: Implementation of the operative phase and preparatory measures as well as the establishment of network measures	The BMBF plans to establish research networks to fight diseases in Africa which are of particular health-policy relevance. The networks are intended to create supranational links between existing structures for health research, training and care.	1, 2, 3, 4, 5	Health, Education, Innovation
8. Consolidation of the ZEI-WAI integration project in Cabo Verde	The BMBF-funded beacon project of the Center for European Integration Studies (ZEI) and the West Africa Institute (WAI) ends in 2015. Various project activities have yet to be undertaken. The main priority at political level is to expand cooperation with the Economic Community of West African States (ECOWAS).	1, 2, 3, 4, 5	Societal development
9. Development of a country strategy for the future direction of cooperation with South Africa as a priority country	Long-term strategic orientation and shaping of cooperation with South Africa taking account of its particular position as an emerging country/influential player	1, 2, 3, 4, 5	May concern all the priorities
10. Examination of potential further support for capacity-building of the African-German Network of Excellence in Science (AGNES) of the Alexander von Humboldt Foundation (AvH)	AGNES serves to pool available expertise in the African Humboldt Network and to provide a contact system to strengthen scientific excellence in Africa.	1, 3, 5	May concern all the priorities
11. Establishment of a vocational training institute in South Africa, the South African Institute for Vocational and Continuing Education and Training (SAIVCET)	The German Office for International Cooperation in Vocational Education and Training (GOVET) is supporting the establishment of a South African vocational training institute on behalf of the BMBF. The decision to implement this concrete measure was agreed between the South African Department of Higher Education and Training (DHET) and the BMBF as part of cooperation on vocational education and training.	1, 3, 4, 5	Education (here: Vocational Education)
12. Increased involvement in the European and Developing Countries Clinical Trial Partnership (EDCTP) for example through active support for expansion to examine further neglected infectious diseases		1, 2, 3, 4, 5	Health, Education, Innovation
13. Evaluation of the instrument of calls for proposals for sub-Saharan Africa; new stimulus for project support with Africa	The BMBF's "Sub-Saharan Africa calls for proposals" were announced in 2010 and 2012. The goal of the funding measure was to serve as an incentive for German universities and companies to develop new cooperative approaches together with partner institutions in sub-Saharan Africa in accordance with the German partners' scientific strengths and problem-solving expertise and in this way to significantly expand and link German development-related research capacities. The effectiveness of this instrument is to be evaluated and, if appropriate, a follow-up measure is to be developed.	1, 2, 3, 4, 5	May concern all the priorities

Measure	Description/Comments	Objectives <sup>8</sup>	Priorities
Africa as a whole			
14. Development of generic instruments for science diplomacy and for education diplomacy	Long-term strategic orientation and shaping of cooperation with Africa	1, 4, 5	May concern all the priorities
15. Involvement in planning the establishment of the Pan-African University (PAU) with a focus on "Energy and Climate" in Algeria: Support for the development of a research agenda	The initiative to found five Pan-African Universities (PAU) was started by the African Union in 2008. The aim of the universities is to improve research excellence and build capacity. They will be set up as centres of knowledge and competence. The BMBF is examining possible involvement in the PAU in Algeria.	1, 2, 3, 4, 5	Environment, Education, Resource management/raw materials, Innovation
16. Establishment of a round table with German industry associations, inter alia to include industry's perspectives more fully in BMBF measures	Many industry associations have their own Africa strategy. These include the German-African Business Association (Afrika-Ver-ein), the Federation of German Industries (BDI), the Association of German Chambers of Commerce and Industry (DIHK) and Germany Trade & Invest (GTAI). The possibilities for cooperation will be explored together with the representatives of the various associations. Further possibilities are thematic round tables for the BMBF's beacon projects (for example health innovations, climate change).	4	Resource management/raw materials, Innovation, may concern the other priorities
17. Creation of German Research Chairs in Africa; implementation and evaluation of pilot measures in Ghana, Cameroon, Senegal, South Africa and Tanzania	The BMBF plans to finance professorships at universities in Africa as part of a German initiative, based on the Canadian initiative "1000 Chairs for Africa" proposed in the G8 context. The aim is to define an own "brand" of German Research Chairs that can set an international best-practice standard for recruitment and equipment and which will also give the BMBF a high level of visibility.	1, 2, 3, 4, 5	Education
18. Expansion of individual support: widening of exchange in both directions	Increased use of individual support instruments in order to promote the advancement of excellence in Africa. The focus includes PhD programmes and the support of inner African mobility (South-South), and of South-South-North and South-North projects. In all cases, allowance is to be made for sufficient research freedom, in particular for young scientists. Initiatives are to be developed in support of administrative abilities and improved application skills. Such important soft skills should receive more consideration in the future.	2, 5	Education, may concern all the other priorities
19. Participation in EU initiatives, such as the call for proposals for Europe as a Global Actor, which supports the EU's cooperation with third countries (in this case: in Africa) and in other multilateral initiatives such as support for institutes of the United Nations University (eg FLORES Dresden and Mozambique)	The aim is to ensure continued participation in strategically important EU initiatives both at political level (HLPD) and operationally within the EU's Research Framework Programme Horizon 2020. With regard to all participation in multilateral initiatives, the degree of activity and the expected benefits in the form of tangible results for multilateral cooperation are under constant review.	1, 2, 3, 4, 5	May concern all the priorities

Measure	Description/Comments	Objectives <sup>8</sup>	Priorities
Africa as a whole			
20. Examination of new strategic partnerships and topics, for example by way of fact finding missions (planned missions to: Cameroon, Nigeria, Tanzania)	Cooperation that is not limited to particular topics is a prerequisite for progress and strategic networking. Concentration on existing priorities and a willingness to cooperate that is not limited to a particular topic are therefore not a contradiction but are mutually complementary. The BMBF will identify further suitable partners in Africa to discuss topics for prioritization and will examine potential strategic alliances with other countries (similar to its alliance with France since 2009) or multilateral organizations (as has already been the case within numerous EU activities) such as the United Nations.	1, 2, 4, 5	May concern all the priorities
21. Supportive expertise (systemic advice) in the areas of research policy, research management and innovation management by way of a special programme for integrated experts at African institutions in the areas of research policy/research management	The plan is to second German experts in the fields of research policy and research management (CIM – Centre for International Migration and Development) to national or regional African institutions in regions in which Germany has a special interest. It is particularly important to flank ongoing BMBF measures.	2, 3, 4, 5	Education, may concern all the other priorities
22. Establishment of a regular Africa dialogue with German universities, non-university research institutions and science funding bodies in order to promote the networking and transparency of activities for Africa in the scientific arena	The BMBF will establish a meeting to take place once or twice per year to exchange information, develop different scenarios and stimulate ideas for joint initiatives.	1, 2, 5	May concern all the priorities
23. Education and research with Africa at a glance: Creation of a website on German involvement with Africa which sets out networking possibilities for organizations from Germany and Africa in the fields of education, research, and industry	The BMBF plans to foster the networking and transparency of Africa activities in the scientific and educational arena. For this purpose, an Africa page is to be created on the Kooperation-International initiative website which will provide a comprehensive overview of initiatives of the BMBF and other German educational and science organizations as well as a communication platform for scientists and academics from Germany and Africa. Consideration will be given to using synergies with existing initiatives, for example those of the DAAD and AvH.	5	May concern all the priorities
24. Support for open access initiatives – providing researchers in Africa with free access to research literature and findings	The BMBF plans to fund open access initiatives to make it easier for African researchers to obtain access to current and technological knowledge. These initiatives will take account of the need to protect intellectual property.	1, 2, 5	Education, may concern all the other priorities

Measure	Description/Comments	Objectives <sup>8</sup>	Priorities
Africa as a whole			
25. Initiatives for the exploitation of social and technological innovations for example in the context of dialogues on innovation with African partners	The BMBF plans to expand its systemic advice where needed. It will examine whether innovation aspects are already part of existing projects or whether and to what extent these can be integrated appropriately. The focus here is on strategies to exploit innovations within Africa. It is also intended that there will be coordination with German industry (eg at the planned round table meetings).	4, 5	Innovation, may concern all the priorities
26. Strengthening the publicity work for BMBF projects in Africa, for example by means of the planned website as well as via publications, events and other marketing tools	In coordination with the BMBF initiatives for research marketing abroad.	5	May concern all the priorities
27. Further support for networking of existing and future BMBF initiatives and development of new measures	The BMBF plans to develop more opportunities for networking. These include events such as the BMBF's Africa Days held in 2014, the joint use of (research) data and the stipulation of networking as a task in projects.	1, 2, 3, 4, 5	May concern all the priorities
28. Analysis of existing German and African or combined German-African networks and the examination of useful networking possibilities in order to make better use of and supplement existing structures	Checking of links with existing scientific networks such as the African Network of Scientific and Technological Institutions, the Academy of Sciences for the Developing World, national academies and alumni networks as well as other science-related multilateral organizations or organizational structures.	1, 2, 3, 4, 5	May concern all the priorities
29. Supporting national policies with education and science diplomacy	Science and education diplomacy is a way of enhancing official relations between countries. Science transcends cultures; it is often performed by multicultural teams. It promotes bridge-building and the improvement of relations between different societies. In this context, education is a valuable asset and a key to success. There is an increasing demand in African countries for education – in particular vocational education and training that is "Made in Germany".	1, 4, 5	May concern all the priorities
30. Participation in the Bologna Policy Forum within the Bologna Process eg by participating in the Bologna Policy Forums 2015 and 2018 during the Ministerial Conferences of the Bologna states	The intention is to ensure the continued participation of the BMBF in a policy dialogue with African states about exchange and cooperation in higher education within the Bologna Process.	1, 2, 3, 5	Education

The measures listed above will be implemented according to current plans. This list may be supplemented or amended by further measures or measures modified due to special circumstances.

<sup>8</sup> Objective 1: Overcoming global challenges through joint effort; Objective 2: Creating high-quality and sustainable, scientific cooperative structures; Objective 3: Strengthening regional and continental cooperation; Objective 4: Strengthening innovative potential and developing markets; Objective 5: Raising Germany's visibility in Africa as a key partner in education and research.

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**Published by**

Bundesministerium für Bildung und Forschung/  
Federal Ministry of Education and Research (BMBF)  
Division "Cooperation with Developing and Emerging Countries,  
Africa and the Middle East"  
10115 Berlin  
Germany

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In writing to  
Publikationsversand der Bundesregierung  
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Germany  
E-mail: publikationen@bundesregierung.de  
Internet: <http://www.bmbf.de>  
or by  
Phone.: +49 30 18 272 272 1  
Fax: +49 30 18 10 272 272 1

**May 2014****Printed by**

Druckerei Franz Paffenholz GmbH

**Layout**

CD Werbeagentur  
Troisdorf

**Photo credits**

BMBF/Jessica Wahl: Page 4  
fotolia: Pages 2, 24 (Monkey Business)  
getty images: Pages 14 (fuse), 18/19 (Zero Creatives)  
shutterstock (Jiri Flogel): Title

**Edited by**

BMBF, Division "Cooperation with Developing and Emerging Countries,  
Africa and the Middle East"

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