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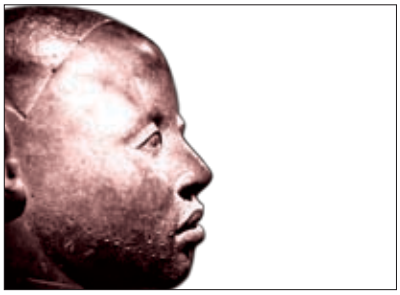

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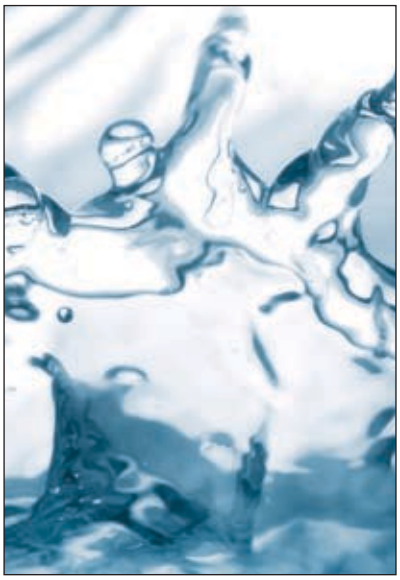

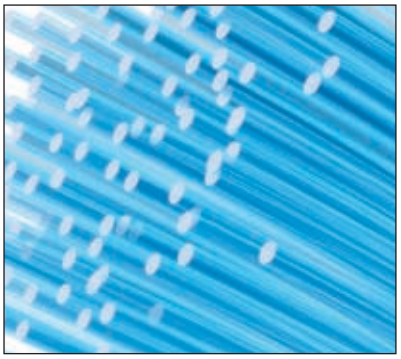

FOREWORD

Africa is a continent with a great pool of untapped scientific talent. The brain-power is there, but the means to translate it into scientific input for socio-economic development need further enhancement. Increasing S&T capacity through cooperation will give African countries and people the tools and skills to create/adapt and disseminate knowledge to mitigate current weaknesses. It will help Africa to develop its resources and provide ways and means to deliver prosperity and sustainable development to its people.

Policy measures to promote and support sustainable S&T capacity building relevant to Africa's economic growth are increasingly undertaken within Africa. Africans themselves have set their own priorities for S&T. The European Union supports and contributes to the realisation of Africa's S&T objectives.

This brochure outlines the development of European S&T cooperation with Africa over the recent past. It describes the learning process we went through to get to point where we are now. It illustrates the link between the political framework, the commitments, the tool kit of mechanisms available and the action on the ground. We want to see Africa become an attractive location to pursue high quality research and we are cooperating with Africa for that to happen.

José Manuel Silva Rodríguez
Director General

1. INTRODUCTION

Africa is the world's second-largest and second most-populous continent after Asia. It covers about 20.4% of the Earth's total land area (some 30 million km²) and accounts for about 14.7% of the world's population (around 1 billion people).

Many aspects of society that we take for granted today can be traced back to early Africa. Ancient Egypt was the first to implement complex governmental and administrative procedures, and was one of the first countries to develop a system of writing as well as having introduced sophisticated agricultural and construction techniques. Ancient Egyptian art and architecture were of such quality that they still inspire awe and fascination today.

It is clear that Africa's contribution to world history and the birth of civilisation has been immense, but this has largely been forgotten in the rise and fall of subsequent empires. Today, the word 'Africa' conjures up a plethora of images: its unique landscapes, people, fauna, an extraordinary variety of cultures, religions, languages and traditional knowledge. But the continent also struggles with conflicts, famine, disease, poverty and huge social inequalities.

Increased acquisition of knowledge is a key element in re-establishing equilibrium between Africa and other parts of the world and in contributing to the sustainable improvement of African people's social and economic well-being.

Europe's historical links with Africa have led to generations of European scientists working in Africa or collaborating with African counterparts on topics of relevance to the continent's development, particularly in the areas of agriculture, medicine and environment.

In today's interconnected world, however, the challenges faced by one country or region can have an impact in far corners of the globe. Some challenges affect every single person living on the planet. These include climate change, environmental pollution, overfishing, the need for new and sustainable forms of energy to replace fossil fuels, and the need to increase food production and improve healthcare.

The urgency, size, cost and global scale of these challenges mean that it makes sense for us to work together to find joint solutions. Overcoming them and contributing towards a more prosperous future of Africa depends on the ability to cooperate with each other. Every continent, every country and every institution should be in a position to contribute its brainpower, expertise and experience to the global effort in order to find solutions. Africa needs to be the driver of this effort.

As Edgar Pisani, European Commissioner for Development, declared in the European Parliament on 16 June 1981 '… development is not just building roads, dams, hospitals, schools, irrigation systems and factories: it is all those things, but it is first and foremost the mobilisation and the organisation of an entire nation which wishes finally to take in hand its economic and social destiny after it has taken its political destiny in hand. Development is not simply transferring technology and technical assistance; it is the acquisition by the poorest countries of the ability to develop techniques suited to their own needs, to train men capable of governing them, of administering their affairs, of managing their economy and of guiding their efforts.' ([1])

In 2002 African ministers have reaffirmed an ambitious target of increasing investment in science and technology (S&T) to 1% of gross domestic product (GDP). Africa's Science and Technology Consolidated Plan of Action ([2]) – endorsed by all African Heads of State – sets clear priorities for the continent, with some countries having already outlined research and development (R&D) priorities in their S&T strategies or plans.

Europe's objective is to support Africans in the development of their own scientific and technical skills and capacity, mastering the knowledge and technology needed for their development and the implementation of their own research agenda. It aims to achieve this by opening up the European Research Area (ERA) and developing equitable and effective research partnerships between the European Union (EU) and African institutions and their researchers.

EU-funded programmes enable researchers in Africa to contribute to – and have an impact on – the resolution of local, regional and global problems, as well as economic and social development.

The development and learning processes of development cooperation were characterised by a succession of policies and institutional frameworks in different configurations.

[1] Food Strategies. A new form of cooperation between Europe and the countries of the third world. Europe Information. Development DE 40 (X/374/82), Dec. 1982.

[2] See http://www.africa-union.org/root/UA/Annonces/HRST/Africa%20s%20Consolidated%20Plan%20of%20Action.pdf online.

2. HISTORICAL BACKGROUND

2.1 SUB-SAHARAN AFRICA

Cooperation between the European Union (originally the European Community) and Africa started in 1957 with the signature of the Treaty of Rome. It provided for the 'Regime of Association', as well as for the creation of European Development Funds (EDFs), aimed at giving technical and financial aid to African countries, many of them still colonised at the time.

The Association Agreement was succeeded first by the Yaoundé I and II Conventions, between EAMA (18 Associated African and Malgache Countries) and six EEC (European Economic Community) countries, supported by resources from the

EDF mainly for financial, technical and trade cooperation. The United Kingdom's accession to the European Community in 1973 paved the way for the extension of the Europe-Africa cooperation to the Commonwealth countries, whether African, Caribbean or Pacific.

The Georgetown Agreement, the ACP (African, Caribbean, Pacific) Group's fundamental charter, was signed in 1975, when the first **Lomé Convention** came into force. This marked the beginning of cooperation between Europe and the ACP Group. The Convention granted non-reciprocal trade preferences to ACP countries and established Stabex – a compensatory mechanism for loss of export earnings due to price fluctuations. It was coupled with the fourth EDF.

Lomé saw the creation of common trade institutions such as the Centre for the Development of Industry and the Centre for the Development of Enterprise. Aid was given for agricultural capacity-building and infrastructure. Under the 'technical assistance' framework, a large number of applied agricultural research projects were implemented in the ACP states (1969-1985).

The so-called Pisani Memorandum of October 1982 made a number of concrete recommendations stressing, among other ideas, the partnership idea, the need for research for development and the necessity of political dialogue. The same discussions led to the development of the first Science and Technology for Development (STD) Programme ([3]), valued at the equivalent of EUR 40 million, as well as the provision, through the EDF, of EUR 68 million for research infrastructure in the ACP states.

The last Lomé (IV) had a duration of 10 years. It was marked by the advent of a 'European Development Policy' as a supplement to the development aid of the Member States. The policy would be based on the principles of cooperation, coherence and complementarity. A new chapter on respect for human rights was included in the amended text of the convention, along with chapters on good governance, democracy and the importance of the rule of law.

A new cooperation model, called the **Cotonou Agreement**, was signed in Benin in June 2000 by the EU and by then 77 ACP countries, representing 1 billion people (a sixth of the world population). It came into force in 2003 with a projected lifespan of 20 years.

One of the Cotonou Agreement's underlying principles is that poverty is incompatible with a global trading environment. ACP

[3] See http://ec.europa.eu/research/iscp/index.cfm?lg=en&pg=policy_readings online.

countries must therefore be drawn into the world economy by a process based on sustainable development that finds a balance between social, environmental and economic goals.

The Cotonou Agreement abandoned non-reciprocal trade preferences between EU and ACP countries. It includes a series of principles reflecting how ACP countries should prepare themselves for competition in a global market.

Although **South Africa** is a member of the ACP group of countries and has signed the Cotonou Agreement, it does not receive development aid from the EDF. Instead it has a bilateral trade agreement with the EU, under the Trade, Development and Cooperation Agreement (TDCA), which entered into force provisionally in 2000 and became definitive in 2004. This free trade agreement allows the mutual opening up of EU and South African markets and provides its own form of aid funding and cooperation procedures. The TDCA covers 90% of South Africa's bilateral trading.

Some EUR 980 million is available under the umbrella of the TDCA for the period between 2007 and 2013 (70% of South Africa's foreign aid funding). The money is being used for job creation and building social infrastructures. Regionalisation is being encouraged as much as possible, as is the involvement of civil society institutions.

The revised SA TDCA includes a new article on S&T, with a budget of EUR 30 million. Additional support will come from the Strategic Partnership between the EU and South Africa, adopted in 2007, which highlights S&T as a priority area of cooperation.

Additional initiatives to harness S&T for development are ongoing and are full of promise. Activities include cooperation and consultation in several international forums, such as those of the Group on Earth Observations (GEO), where South Africa and the European Commission have important leadership roles as co-chairs.

2.2 NORTHERN AFRICA

In parallel, the EEC's Mediterranean policy took shape during the first half of the 1970s, resulting in a series of bilateral cooperation agreements with states bordering on the Mediterranean Sea. Bilateral trade and cooperation agreements were signed with individual countries on the basis of the 'Global Approach to Mediterranean Policy', a position paper adopted in 1972.

In November 1995, the European Commission decided, as a strategic response to economic and demographic developments in the Mediterranean region, to upgrade this cooperation, setting in motion what became known as the 'Barcelona Process'. The innovative alliance, based on the principles of joint ownership, dialogue and cooperation, brought together the Member States of the EU with 12 southern and eastern Mediterranean states.

The **Barcelona Declaration** emphasised the need for the two regions to build an area of peace, security and shared prosperity together. Technology transfer made a first appearance in EU-Africa agreements with the promotion of support mechanisms, outlined as one of four initial priorities for the establishment of the Euro-Mediterranean Free Trade Area (FTA). The declaration also recognised that science and technology (S&T) in the Mediterranean have a significant influence on socioeconomic development.

Almost 10 years later, the **European Neighbourhood Policy (ENP)** forged further links following its creation in 2004. The policy recognised that a larger EU (having grown to 25 members by this time) required a framework that would avoid the emergence of new dividing lines between the bloc and its neighbours. The ENP addresses the EU's immediate neighbours to the east and to the south, and thus includes all North African countries (Algeria, Egypt, Libya, Morocco and Tunisia).

The central elements of the ENP are its bilateral Action Plans between the EU and each partner, which set out an agenda of political and economic reforms with short and medium-term priorities. The following S&T-related actions are foreseen in Action Plans with most of the North African countries:

- accelerated integration of the partner country into the European Research Area (ERA) and the Community Framework Programme (FP);
- development of scientific and technological capacity with a focus on the use of research and technological development (RTD) results by industry and small to medium-sized enterprises (SMEs);
- promotion of the integration of the partner country into scientific high-level exchanges.

The most recent milestone in EU-Mediterranean cooperation is the Union for the Mediterranean (UfM), launched in Paris in July 2008. The UfM has the goal of infusing new momentum into the partnership, offering more balanced governance and increased visibility. All North African countries are members. It focuses on

- de-pollution of the Mediterranean;
- maritime and land highways;
- civil protection;
- alternative energies: Mediterranean Solar Plan;
- higher education and research, Euro-Mediterranean University;
- the Mediterranean Business Development Initiative.

The **Monitoring Committee for Euro-Mediterranean Cooperation in RTD (MoCo)** is a platform for policy dialogue bringing together senior officials responsible for S&T issues from the Mediterranean Partner Countries (MPCs) – namely all North African countries, the EU Member States and Associated Countries. It was established in the context of the Euro-Mediterranean Partnership or Barcelona Process and plays a central role in monitoring and stimulating Euro-Mediterranean S&T cooperation ([4]).

Moreover, the EU has **bilateral S&T cooperation agreements** with Egypt, Morocco and Tunisia, and is negotiating one with Algeria. Under the agreements, specific measures are implemented by both sides to promote S&T policy dialogue and practical cooperation.

The EU recognises that scientific knowledge is essential to reducing poverty, improving quality of life and maintaining competitiveness. It works to internationalise S&T by encouraging international research collaborations with Sub-Saharan Africa (SSA), both to benefit the European Research Area (ERA) and to enable Africa's researchers to contribute to the solution of local, regional and global problems, and thus to economic and social development.

[4] Monitoring Committee for Euro-Mediterranean Cooperation in RTD (MoCo) (http://www.miraproject.eu/moco).

3. KNOWLEDGE COOPERATION TODAY BETWEEN THE EUROPEAN UNION AND AFRICA

– A NEW BEGINNING

3.1 OVERVIEW OF EU POLICY AND THE EU-AU STRATEGIC PARTNERSHIP

Since the historic first Africa-EU Summit in Cairo in 2000, where the partnership between the two regions was strengthened through the institutionalisation of policy dialogue, countless changes have taken place on both continents.

Democratisation and reform processes have been launched and are being deepened in both Africa and Europe. The integration processes on both continents have accelerated with the establishment of the African Union (AU), while the European Union (EU) has been enlarged to 27 Member States. New international and global challenges have emerged, globalisation has accelerated and the world has become increasingly interdependent.

In response to these changes, cooperation between Africa and the EU has rapidly developed to forge a new and stronger partnership that builds on their new identities and changed institutions, capitalises on the lessons of the past and provides a solid framework for long-term, systematic and well integrated cooperation.

A new Joint Africa-EU Strategy was adopted by the Heads of State and Government at the Lisbon EU-Africa Summit in December 2007 with the goal of taking the Africa-EU relationship to a new, strategic level with a strengthened political partnership and enhanced cooperation at all levels. The Strategic Partnership is based on a Euro-African consensus on values, common interests and common strategic objectives. This Joint Strategy provides an overarching long-term framework for Africa-EU relations, to be implemented through successive short-term Action Plans and enhanced political dialogue at all levels. The result will be concrete and measurable outcomes in all areas of the partnership. The Strategy will strive to bridge the development divide between Africa and Europe through the strengthening of economic cooperation and the promotion of sustainable development in both continents.

The Joint Africa-EU Strategy identifies strategic priorities in the area of peace and security, democratic governance and human rights, trade and regional integration and other key development issues. It also reinforces political dialogue between the EU and Africa in order to:

- go beyond the framework of simple development cooperation by opening up the EU-Africa dialogue to address shared political concerns and issues of common interest;
- broaden relations from a strategy focused exclusively on African concerns to one that addresses European and global issues and promotes action in the relevant forums;
- move beyond fragmented support for African aspirations so as to find regional and global solutions to the most important challenges;
- guarantee increased participation of African and European citizens in the strategic partnership, thus contributing to the strengthening of civil society on both continents.

The strategy's tenets are explained in greater detail on the official web site ([5]).

The selected priority actions will be implemented through eight specific **'Africa-EU Partnerships'** on subjects of common interest, which add value to existing cooperation and political dialogue. These include trade conditions, climate, peace and security, the democratic rule of law, migration, employment, science, the information society and space. The Partnerships will focus in particular on actions at the global, continental or regional level, where there is a clear comparative advantage of joint action as opposed to cooperation at the national level, where the partners have a collective capacity to deliver.

[5] See http://www.africa-eu-partnership.org/index_en.php online.

3.2 THE EIGHTH PARTNERSHIP: 'AFRICA-EU PARTNERSHIP ON SCIENCE, INFORMATION SOCIETY AND SPACE'

– IMPLEMENTATION MECHANISMS

The purpose of the Eighth Partnership is to:

- support S&T capacity-building in Africa and implement Africa's Science and Technology Consolidated Plan of Action;
- support the development of an inclusive information society in Africa;
- enhance cooperation on space applications and technology.

The Eighth Partnership is a cornerstone in the EU's new science and technology (S&T) cooperative relationship with Africa. It calls on the EU to support S&T capacity-building in Africa. After all, Europeans and Africans alike realise that having a strong S&T base will drive sustainable development.

The world has realised that scientific know-how and the ability to assimilate and use knowledge for social and technological development are drivers of economic prosperity and greater societal development.

The Eighth Partnership between the EU and Africa is an opportunity to participate actively in this dynamic through promoting the establishment of an information and knowledge society. Harnessing the benefits of space observation is also important. Each of these priorities will be reinforced under the Eighth Partnership. *(See section 5.2 on the first steps to implementing the Partnership).*

In 2008 the European Parliament adopted a resolution ([6]) outlining the particular importance that it attaches to supporting scientific cooperation with Africa. The 10-point resolution acknowledges the trend of policy makers in Africa prioritising S&T and 'urges the Member States to promote S&T cooperation with Africa that will rapidly secure genuine and comprehensive development of the knowledge and technologies in the African countries themselves'.

[6] P6_TA(2008)0067.

3.3 THE IMPLEMENTATION OF EU POLICIES – POTENTIAL FOR SYNERGIES

The implementation of the EU-Africa Eighth Partnership can be seen as an example of real synergy between the EU Development and Research policies and instruments. From a set of 19 projects identified by the African Union Commission, the so-called Lighthouse Projects, two were identified as 'Early Deliverables' under the 'science' sector:

1) The first scientific Lighthouse Project on 'Water management and Food security in Africa' is covered by an FP7 (7th European Research Framework Programme, 2007-13) dedicated call for Africa published in July 2009. For the first time ever, the European Commission's Directorate-General (DG) for Research has published a call targeting one continent, Africa. With a budget of EUR 63 million, this call has a multidisciplinary approach, integrating various scientific research fields such as food, agriculture, health, land and water in the African basins.

2) The 'African Research Grants' initiative has been launched at the beginning of 2010. The EU makes EUR 15 million available from the European Development Fund (EDF) for proposals on topics defined by the African research community. The programme is administered by the African Union Commission.

Two important aspects of these initiatives should be highlighted:

- They correspond directly to African needs and scientific priorities as set out in the African 'Science and Technology CPA (7).
- They symbolise the importance of coherence between different policies. The African Research Grants initiative is funded through the EDF and the 'Water management and food security in Africa' call is funded by European research funds.

Similar synergies are being practiced with other implementation mechanisms of EU policies and, whenever possible, with EU Member States' bilateral activities. The instruments lending credibility to the policies and enabling concrete implementation activities are outlined below. There are instruments of other policies, which might well have increasing potential in the future, such as programmes under the education and culture as well as regional policies. The principal ones are presented below.

[7] See http://www.africa-union.org/root/UA/Annonces/HRST/Africa%20s%20Consolidated%20Plan%20of%20Action.pdf online.

3.4 INSTRUMENTS FOR POLICY IMPLEMENTATION

The EU's collection of policy implementation tools are used so as to ensure complementarity. They are often used in synergy, giving real added value to the support for research projects.

Previous European Research Framework Programmes (FPs) had a cycle of five years; the current and seventh edition not only lasts for seven years, but also has new elements.

The Seventh Research Framework Programme (FP7: 2007-13) has more than EUR 50 billion to invest in research projects – 63% more funding for science than its predecessor, FP6 (2002-06). The FPs strengthen Europe's research base, both in industry and business, and are the principal instrument for creating the European Research Area (ERA) and opening it to the world. Now the whole of FP7 is open to international cooperation. Teams from all African countries are eligible for funded participation in FP7, along with their peers from EU Member States and the 12 countries associated in 2009.

While the FPs are the leading research funding instrument for collaborative research, Africa should also make use of other Community instruments. Substantial support is available from the EDF, the European Neighbourhood Policy Instrument (ENPI) and thematic Development Cooperation Instruments (DCIs). Strengthening scientific and technological capacities of people and institutions in Africa is a key challenge, but success will strengthen their preparedness for cooperative research with Europe and open up access to advanced scientific knowledge and networks. Active participation in the creation and use of such knowledge in turn enhances their wider development potential.

3.4.1 THE EUROPEAN DEVELOPMENT FUND

Set up initially under the Treaty of Rome in 1959, the European Development Fund (EDF) is the main aid fund for Sub-Saharan African, Caribbean and Pacific (ACP) countries. It offers both technical and financial assistance.

The EDF runs typically for blocks of four to five years. The tenth edition runs from 2008 to 2013 with an overall budget of EUR 22.682 billion. This latest round of funding includes provisions for building new capacities in scientific research – in S&T training and education, large-scale S&T infrastructures and human resources.

Creating synergies between different EU instruments such as the FPs and the development funds, while continuing to increase the coherence between different policy instruments, is vital. Without good scientific infrastructure and well-trained staff, African countries will not be able to participate effectively in all that FP7 has to offer. A concrete example of positive synergies between development funding and scientific research programmes is given in the box on the side.

3.4.2 THE EUROPEAN PROGRAMME FOR RECONSTRUCTION AND DEVELOPMENT IN SOUTH AFRICA

The European Programme for Reconstruction and Development (EPRD) in South Africa runs in parallel to the Trade and Development Cooperation Agreement (TDCA). It was set up in 2004 to fund development in South Africa and is equivalent to the EDF.

The EPRD channels a budget of EUR 30 million into supporting specific activities of the South African Department of Science and Technology (DST). The collaboration has led to some impressive results. Among others is South Africa's success rate in the first two years of FP7 participation – 122 research entities were already involved in projects – almost as many as participated in the whole of FP6.

THE PROGRAMME FOR S&T INNOVATIONS AND CAPACITY BUILDING IN ACP COUNTRIES – AN EXAMPLE OF SYNERGY BETWEEN POLICIES.

The ACP S&T Capacity Building Programme (PSTICB) was established to bolster capacity in Africa to support research and innovation activities in the areas most crucial to development: healthcare, transport, energy, climate change, agriculture and sustainable trade. It is doing this at three levels:

- institutional, administrative and policy making;
- academic, research and technology;
- business and civil society.

The programme has a budget of EUR 35 million, with EUR 30 million coming from the EDF and EUR 5 million from South Africa's share of the European Programme for Reconstruction and Development (EPRD). This allows South Africa to participate in the PSTICB. The programme takes an interdisciplinary approach to sustainable development in the above areas.

3.4.3 THE EUROPEAN NEIGHBOURHOOD POLICY INSTRUMENT

The European Neighbourhood Policy Instrument (ENPI) is an extension of the former MEDA Programme for North African countries. Its rationale is the development of a knowledge-based society, widely regarded as fundamental to socioeconomic progress and a challenge for ENP countries.

Maintaining good relations with their EU neighbours is also of huge importance for countries of the Mediterranean Basin in terms of stability. Cooperating with EU Member States in scientific research is not only of mutual benefit in tackling the specific problems or opportunities investigated, but for relations in general.

The ENPI's capacity-building initiatives are now consolidating the long-standing targeted efforts of successive EU Research FPs. The current funding remit includes EUR 12 million for Tunisia and EUR 11 million for Egypt. The grants should enable both countries to improve the capacity of their research systems, strengthen links between research and innovation and increase participation in the FPs.

3.4.4 THE DEVELOPMENT COOPERATION INSTRUMENT

The Development Cooperation Instrument (DCI) is the legal base for six thematic cooperation programmes working on policy objectives that have no geographical limitations. In each case, the goal cannot be fully achieved through country or region-level initiatives. These thematic programmes were adopted in January 2006 and cover the following domains: food security; investing in people (health and education); environmental and sustainable management of natural resources, including energy (ENRTP); non-state actors and local authorities in development; human rights and democracy; migration and asylum.

The Food Security Thematic Programme (FSTP) has a total budget of EUR 925 million for the period from 2007 to 2010, of which EUR 233.1 million is allocated to 'Supporting the delivery of international public goods contributing to food security: research and technology'. This amount includes contributions to global and regional agricultural research efforts (including the Consultative Group of International Agriculture Research, CGIAR) and other complementary efforts to the research collaboration supported by successive FPs.

The Thematic Programmes 'Investing in People' and ENRTP have overall indicative budgets of EUR 1.06 billion and EUR 804 million, respectively, for the period from 2007 to 2013.

3.4.5 SPECIFIC PROGRAMMES UNDER FP7 IMPLEMENTING INTERNATIONAL SCIENTIFIC COOPERATION

FP7 is subdivided into several Specific Programmes as follows:

The **Cooperation** Programme is structured into 10 Themes and it funds collaborative research. It covers a broad range of subjects and also has the largest slice of the EUR 50 billion available under the FP7 – it accounts for two thirds of the total or more than EUR 32,413 billion. It includes the following Themes: health; food, agriculture, fisheries and biotechnology; information and communication technologies (ICT); nanosciences, nanotechnologies, materials and new production technologies; energy; environment (including climate change); transport; socioeconomic sciences and humanities; space; and security. Research funded under the Cooperation Programme needs to meet the highest standards of scientific excellence as well as contribute to problem solving and other objectives. All Themes are open to international cooperation, but certain topics are specifically identified as desirable or even compulsory for such cooperation.

The **Ideas** Programme supports frontier research in any area of science or technology solely on the basis of scientific excellence. The programme is implemented by the European Research Council (ERC). Its budget allocation is EUR 7,510 billion.

The **People** Programme provides support for researcher mobility and career development in the EU and abroad. Its overall allocation in FP7 is EUR 4,750 billion. The international incoming and outgoing Marie Curie Fellowships, Initial Training Networks and International Staff Exchange Scheme (IRSES), among others, cater for individual and institutional international cooperation. African researchers carrying out research in Europe under the Marie Curie Actions may obtain a reintegration grant to help 'brain circulation'.

The **Capacities** Programme is geared towards strengthening research capabilities through several horizontal programmes with an overall allocation of EUR 4,097 billion. The areas covered range from research infrastructures, including their international dimension, to institutional support for international scientific cooperation activities. Support for international cooperation comes in different forms. It can fund, for example, support activities to bilateral and bi-regional policy dialogue, priority setting and the promotion of cooperation through INCO-Nets. Funding also supports the coordination of EU Member States' international S&T priorities through such programmes as ERA-Nets and ERA-Nets+. The International Cooperation (INCO) Programme under Capacities has an allocation of EUR 180 million.

The **Joint Research Centre (JRC)** of the European Commission has a dedicated programme within the FP to carry out and monitor research in support of Community policies including development policy (EUR 1,751 billion). It cooperates with numerous institutions in and outside of Europe.

Nuclear Research is supported through the **EURATOM Treaty** on a separate legal base. It has two components: fusion energy research (in particular the international thermonuclear experimental reactor — ITER) and nuclear fission and radiation protection on the one hand, and the activities of the Joint Research Council (JRC) in the field of nuclear energy, environmental impact, nuclear safety and security, on the other.

The **plans** for implementing the specific programmes are published by the European Commission in annual work programmes. The documents provide detailed descriptions of research topics to be funded through competitive calls for proposals, schedules for these calls, details on participation and deadlines. Most funding schemes, particularly in the Cooperation Programme, require the formation of multi-partner consortia to address the research topics in the calls. Proposals will only be accepted when they correspond to the topics indicated in the work programme, are received in time and get high marks in the evaluation (see below).

Funding schemes under FP7: Collaborative Projects, Networks of Excellence, Coordination and Support Actions, Individual Projects (ERC), Support for Training and Career Development, and Research for the Benefit of Specific Groups – in particular small and medium-sized enterprises (SMEs): these make up the principal funding schemes under FP7.

Proposals are independently evaluated by external experts and the most relevant and high quality proposals receive funding.

Extensive information on all steps of the funding process can be found at http://cordis.europa.eu/fp7 online. Many countries, including International Partner Cooperation Countries in Africa, have nominated FP7 contacts who provide information and coaching to their researchers and teams with the aim of facilitating participation.

The projects featured in Annex 1 show what has already been achieved thanks to the FPs and as a result of endeavours by EU and African researchers, scientific and governmental as well as civil society organisations and companies. The central thrust across many of these collaborations is the drive to find sustainable solutions fitting the specific African contexts while developing new scientific knowledge further. Findings that will have a genuine impact on people's lives have resulted from collaborative research in water conservation, disease control, food security, agriculture, livestock farming, climate change, ecosystems, marine degradation, bioenergy development, communications technology, disaster management, cultural heritage conservation, and gender and demographic studies and more. On a horizontal level, foreign private investment in Africa is rising and a growing number of African research teams are also working with European colleagues by signing up to international projects. The potential created can be great. As the new knowledge opens new options on – sometimes old – problems, its impact will grow over time as it spawns social and technological innovation.

In addition, many EU Member States have substantive bilateral research and development cooperation programmes with African countries, which are often synergistic or complementary to projects and programmes at the European level.

4. FROM POLICY TO ACTION

In the Sixth Framework Programme (FP6), some 322 research projects enabled 882 African participations. The African teams involved were supported by some EUR 95 million to facilitate their participation in international scientific activities. While the total value of these projects was more than EUR 1 billion, it is probably more important to underscore the participation in international knowledge networks.

These projects are for the most part completed now and will continue to deliver results and publications in the near future. They represent a considerable asset not only for African researchers and research users, but also for their European and international peers to build even stronger cooperation in the future. Making ever more efforts to connect research to ongoing policy dialogues and to operational capabilities in African countries is the best way to continue increasing its impact and supporting the Eighth Partnership effectively.

This chapter gives a 'flavour' of the diversity and scope of past and ongoing scientific cooperation, and concludes with information on specific activities, such as the lighthouse projects and the 'Africa call' published in July 2009 under FP7 (2007-13) and other instruments to illustrate how the learning and commitments from the political processes translate to concrete action. The overall participation of African teams in FP7 is encouraging with 2 821 participations in proposals, of which 579 were successful (data from February 2010), a success rate of 21%.

4.1 HIGHLIGHTS FROM RESULTS OF PAST AND ONGOING COOPERATION

The highlights on results from past and ongoing cooperation clusters lines of research which address major challenges African societies are facing. Some examples for each type of challenge are given in Annex 2 to avoid overloading the text. They illustrate a wide range of concrete activities which contribute to policy implementation. The titles and additional information on all 322 FP6 projects involving African teams is available on the INCO website ([8]).

If the universally agreed Millennium Development Goals (MDGs), and in particular the reduction of poverty and stimulation of economic growth in developing countries, especially in Africa, are to succeed, we need to be successful on a number of inter-related fronts.

Integral to achieving both is international scientific cooperation. It is a necessary condition for the countries in Africa to catch up with living conditions present in other parts of the world, but research needs to be combined with other policies and measures to realise its full potential.

Developing countries are starting to make better use of their scientific potential by participating in cooperation that knows no boundaries. The EU is at the forefront of this effort, proving that collaboration between researchers, academics and other societal stakeholders with policy makers and industry players is not only conceivable, but a prerequisite to success.

[8] See http://ec.europa.eu/research/iscp/index.cfm?lg=en&pg=africa-4a online.

4.1.1 INSTITUTIONAL SUPPORT FOR S&T COOPERATION BETWEEN EUROPE AND AFRICA

The desire for increased effectiveness of scientific cooperation means that efforts have been stepped up in recent years on science and technology (S&T) dialogue and flanking measures, which create better success conditions for individual research collaborations. In the case of countries which entered into a formal S&T cooperation agreement with Europe, support projects are co-funded by the Capacities Programme of FP7 (so-called BILAT projects). They promote increased participation of that country's research teams in FP7 and otherwise help implement the agreement. The European-South African Science and Technology Advancement Programme (ESASTAP) was the first in this category ([9]).

Moreover, all African countries are encouraged to nominate FP7 contacts to support their teams with information and coaching and make links to wider capacity strengthening activities e.g. under development cooperation.

Key contributors to strengthening S&T alliances between Europe and parts of Africa are two joint Europe-Africa S&T dialogue and promotion platforms at bi-regional level:

- the Mediterranean Innovation and Research Coordination Action (MIRA) ([10]) programme, covering the African-Mediterranean area of Algeria, Egypt, Libya, Morocco and Tunisia;
- the Network for the Coordination and Advancement of Sub-Saharan Africa-EU Science and Technology Cooperation (CAAST-Net) ([11]) supporting links between Europe and Sub-Saharan African countries;
- these two INCO-Nets will receive some topping up to facilitate the revision and upgrading of ongoing initiatives as well as opening to new partners;
- additional support for the coordination of national policies on S&T cooperation between Europe and Africa will be provided under an ERA-Net (ERAFRICA) currently under negotiation.

[9] See http://www.esastap.org.za online.

[10] See http://www.miraproject.eu online.

[11] See http://www.caast-net.org online.

4.1.2 COLLABORATIVE RESEARCH PROJECTS

In the following, the context of international scientific cooperation between European and African teams is summarised along sustainability challenges that these research collaborations addressed. At least one or two examples are given for each challenge in the Annexes. Emphasis is placed on FP6 projects which are already delivering results. Some FP7 projects, which have recently started, are also included. More is to be expected, because the results of African teams are encouraging: with 579 successful participations in 249 project proposals out of 2821 applications, these teams scored a success rate of 21% (data from February 2010).

4.1.2.1 *Food security, agriculture and animal production*

The World Food Summit ([12]) of 1996 defined food security as a situation 'when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life'. The concept commonly includes both physical and economic access to food that meets dietary needs as well as food preferences. It is based on three main components: availability (enough food to feed everybody), access (the physical and economic means to get food), and use (enough knowledge, water and sanitation to make good use of the food).

Enhancement and diversification of agriculture, livestock production, and processing and marketing are at the core of socioeconomic development within most societies worldwide. Population growth, urbanisation and diversification of economic activities effectively fuel the creation, accumulation and dissemination of knowledge. The relationship between investment in agricultural research and development, and outcomes in terms of higher and more reliable yields in Africa, is well established ([13]). This applies to both major commercial crops, as well as underexploited species with the potential to enhance the value added and sustainable use of biodiversity.

The EU Member States and the European Community make very significant contributions to international research on the major global food crops delivered through the 15 Research Centres in the Consultative Group of International Agriculture Research (CGIAR) ([14]), four of which are based in Africa. The nature and coordination of the EU Member States and Commission's input is discussed by diverse bodies, such as the European International Agricultural Research for Development (EIARD) ([15]) Forum.

The Commission's Joint Research Centre (JRC) ([16]) uses satellite technology and airborne remote sensing to monitor crops in Africa aiming at supporting the EU's Food Security and Food Aid Policy. Technical advice, monitoring and evaluation is provided to EC-funded projects and programmes in food security, mainly implemented with the United Nations agencies FAO (Food and Agriculture Organization) and WFP (World Food Programme), so that swift decisions can be made on crop health, ripeness and harvesting times. This is done in cooperation with the EU Food Security and Food Aid Policy. There is also cooperation with the Global Monitoring for the Environment and Security (GMES) ([17]) initiative.

[12] See http://www.fao.org/wfs/homepage.htm online.

[13] W.A. Masters, 2005. Paying for Prosperity: Investing in African Agricultural R&D.*J.Int. Affairs*, 58(2):35-64.

[14] See http://www.cgiar.org/ online.

[15] See http://www.eiard.org/ online.

[16] See http://ec.europa.eu/dgs/jrc/index.cfmhttp://mars.jrc.it/mars/About-us online.

[17] See http://www.gmes.info/ online.

Undoubtedly, livestock is a critical socioeconomic resource in many parts of Africa and its health is closely linked to that of agriculture and affects socioeconomic conditions in many African countries. Researchers are striving to keep at bay the major diseases to which livestock are susceptible. Other aims include increasing sustainable productivity by providing knowledge and tapping into significant development cooperation programmes, such as decade-long efforts to eradicate African Rinderpest – a disease that wreaked havoc on Africa's agricultural sector in the past, depriving farmers and herders of meat, milk and fertiliser.

Cross-cutting challenges around water and food security under conditions promoting sustainable development is one of the main focuses of the Eighth Partnership for joint EU-Africa projects (see below).

Annex 1 presents summaries of some of the collaborative research projects that fall into three clusters around food security in Africa. They are the 'bread-and-butter' collaborations that have mobilised European and African research teams together on issues in previous or current Research Framework Programmes, intended to generate knowledge that is essential for problem solving in Africa.

4.1.2.2 *Sustainable use of natural resources*

The Millennium Ecosystem Assessment ([18]) is the most comprehensive attempt so far to document terrestrial and aquatic ecosystems across the globe. Human demography, expanded exchange and efforts to improve living standards are, with few exceptions, increasing the strain on natural resources and their ecosystems.

The impact of human activities can be felt across the globe; even relatively sparsely populated areas are not immune. At the same time, research offers many opportunities to better understand the underlying dynamics and find more sustainable ways of pursuing social and economic goals. It helps halt the vicious circle of development that causes environmental degradation, undermining livelihoods and economic prospects for the future.

Africa is home to diverse ecosystems across its climate zones, including the very arid regions of northern Africa, the dry savannas of the Sahel and southern Africa, the Saharan and Namibian deserts, as well as very abundant water resources and forests in the wider Congo Basin of central Africa and the Nile valley. Coastal zones also boast significant diversity, from the fertile shallow shelves near major river mouths or west coast upwelling areas, to coral areas in eastern Africa and

mangroves between fresh and salt water in tropical and sub-tropical regions. Intact ecosystems and their resources are the foundation on which agriculture develops.

Agricultural developments consume, in most areas, up to 80% of fresh water. Forests and mixed agro-forest areas provide environmental stability, carbon capture, fodder for livestock, food, fibre and energy for a large section of the population, particularly those without access to alternative sources of energy and construction materials. Rivers, lakes and coastal zones also provide fish and other aquatic products as well as transport routes for people and products. Soil, land use and the state of natural resources are intimately linked to climate, human health and resilience to natural hazards.

[18] See http://www.millenniumassessment.org online.

Urbanisation processes, along the West African coasts for example, have intensified over the past several decades. They bring with them heightened demand for a wider range of goods and services, and the markets that form as a result also drive greater diversification and social and technological innovation. They also offer opportunities for supplying basic services to citizens in a more cost-effective way compared to covering dispersed rural communities.

Countries, particularly in the arid and semi-arid regions of northern Africa, but also in southern Africa, are facing severe water scarcity, with fresh water availability per capita being among the lowest in the world. Climate change is expected to add to these existing strains.

Policy and systems research address these constraints, by also focusing on gender-responsive sustainable development. By pooling their resources, European and African researchers are showing how solid efforts can curb adverse effects and promote sustainable management systems in Africa. Examples of projects are given in Annex 2.

4.1.2.3 *Healthier societies*

Data show that accumulated health problems and comparatively weak healthcare systems put pressure on Africa, and translate to a much-reduced average life expectancy at birth. Pandemics such as HIV/AIDS, Malaria and Tuberculosis have attracted international attention in terms of diagnostics and drug development. Despite efforts to combat the problems, social and health crises persist.

Moreover, famously 'neglected diseases' such as schistosomiasis, lymphatic filariasis, onchocerciasis and leishmaniasis, as well as other water-borne diseases associated with poverty and political marginalisation, poor sanitation and hygiene education, still claim many avoidable victims. Infant and maternal mortality, particularly in Sub-Saharan Africa, is among the highest in the world. This tragic situation calls for intensified research and follow-up on health policy, and the design and management of healthcare systems. Priorities include access, affordability and reliability.

Health conditions are also intimately linked to nutrition, safe water, and sanitation, and wider environmental conditions. Lasting improvements require progress on several fronts at the same time. A review of 20 years of partnerships in health systems research between Europe and Africa and other developing regions highlighted the need to strengthen public health systems and enable better uptake of research results in policy formulation and implementation.

An international conference on neglected infectious diseases organised in 2006 by the European Commission highlighted medical and policy research issues. Priorities include using research to form policy and to enable healthy, sustainable societies. Results obtained in these kinds of studies contribute to strengthening development cooperation and WHO programmes.

A package of new research projects is expected to receive funding of EUR 39 million under the Eighth Partnership of Science, Information Society and Space, under the Better Health for Africa part of the Africa Call published in July 2009 (See Section 4.2). Annex 3 presents a number of earlier and ongoing research collaborations and initiatives illustrating the scope of existing international S&T cooperation with emphasis on sustainable and public health.

4.1.2.4 *Development of energy and industrial processes in Africa*

Africa as a whole is well endowed with energy, water and mineral resources, but actions to harness and distribute these resources so as to give them more sustainable footing are erratic. Developing fossil and renewable resources, from coal and uranium to solar, hydro and biomass, under specific conditions in different localities and regions of Africa, is a major challenge that needs increased research input.

Initial attempts at industrialisation during the post-colonial period were hampered by a number of factors in some African countries – fundamental requirements in terms of physical and communication infrastructure, appropriate human capital, social organisation, skills and investment possibilities had not been established. As a result, industrial developments were often driven by foreign direct investment (FDI), and only partially addressed local needs. Collaborative research involving teams from Europe and Africa will develop the knowledge and local human resource base in Africa so that it can adapt and generate context-specific solutions. An example of a research project involving African research teams is shown in Annex 4.

4.1.2.5 *Integrating Africa into the knowledge society of the future*

The end of the 1990s gave birth to the concept of the 'knowledge society' – a society where knowledge is considered a primary production resource, partially replacing capital and labour. A knowledge society should create conditions where citizens are both providers and users of a common pool of knowledge. Such a society can create and use knowledge in a way that strengthens and inspires sustainable development.

Initiatives have commenced in Africa to put the continent on the knowledge society map. In particular, Africa was included early in the development of a network of high-speed internet connections. But these were initially confined to meeting the needs of some of the major mining companies, among others.

Africa has begun a major drive to combine investments so as to create an improved communication infrastructure through the expansion of telephone and Internet access that benefits a much wider range of public and private sector organisations as well as ordinary citizens. Part of the challenge is to strengthen local capacity, including connections between African researchers and their peers in Europe and elsewhere, on issues of major relevance. Annex 5 presents a knowledge society research project involving African partners. More examples are given in Section 4.2 on implementing the Eighth Partnership.

4.1.2.6 *Demography and societal challenges*

Africa is the second most populous continent after Asia. With close to 1 billion citizens, Africa is home to 14.8% of the human population according to 2009 estimates. Its population has climbed rapidly over the last 40 years and is therefore relatively young. In many African countries more than half of the population is under the age of 25. Migration and other factors mean that many African households are headed by females and social gender roles keep evolving.

Women are catching up with men in terms of access to primary and secondary education, but are still underrepresented in science. The African Union recently established a prize to recognise scientific achievements by women. The award will provide more visibility and incentives, encouraging a larger cross-section of the population to create and use scientific knowledge.

African populations are already feeling the impact of climate change, but there is disagreement on whether other factors are affecting the extent of this change. In a continent

where 40% of GDP comes from agriculture, crop failures can reach catastrophic proportions, while the high number of people in poverty means resistance capacity to such disasters is weak. Science and technology, and the ability to tap into all forms of existing knowledge – including traditional knowledge and international scientific know-ledge – are all necessary to enhance local and regional capabilities to cope, adapt and shape more sustainable futures. This will entail many changes, which will not necessarily be the simple extension of past practices or experiences. Annex 6 illustrates with few examples show that evidently even small activities can have considerable leverage; this also holds for the wide-ranging facets of contemporary cooperation focused on people and social interactions.

4.1.2.7 *Cultural heritage*

Africa, particularly central eastern Africa, is regarded as the origin of the human species and its ancestors. The earliest modern humans found in modern-day Ethiopia are dated to almost 200,000 years ago. The Ishango Bone from today's Rwanda dated to around 20,000 years ago marks the beginning of a mathematical system. The first cultivation of wild relatives of wheat and barley took place in Africa perhaps as long ago as 11,000 to 13,000 BC, of cotton earlier than 5,000 BC. It is speculated that by 6,000 BC cattle were already domesticated in North Africa. By 500 BC metal working became more widespread in West Africa. Iron working was fully established by roughly 500 BC in many areas of East and West Africa.

The legacy of concrete and intangible attributes left behind by a group or a society's past – attributes inherited, maintained and bestowed for our future generations – is what we call cultural heritage. Research here is about more than preserving artefacts in a museum. Landscapes too are part of cultural heritage, and some have been profoundly influenced by human intervention through the millennia, for example by water management practices.

Buildings, objects, practices and other testimonials to scientific knowledge and technologies, along with artistic expression in earlier periods, are the foundations on which today's societies build and from which they derive their sense of identity. Indeed, knowing the past allows us to set meaningful objectives for the future.

Well-recovered and accessible cultural heritage is also an increasingly important source of economic gain, for example from cultural high-value tourism. Northern African countries have been particularly active in this arena and several research collaborations have focused on revitalising traditional water management approaches in today's changed socioeconomic context.

They have also investigated innovative conservation approaches with respect to the mining of precious metals and ancient buildings. Contributing to long-term sustainability is a shared concern for all these countries.

Annex 7 presents a research project involving African research teams working on the preservation of their cultural heritage and exploring new economic opportunities in a modern context.

4.1.2.8 *Ethics – a necessary underpinning of all pursuit of knowledge and international scientific cooperation*

Ethics is an integral part of EU research policy and is an indispensable part of the international cooperation activities in the FP7. In Article 6 of the FP7 Decision, it is stipulated that: *'All the research activities carried out under the Seventh Framework Programme must be carried out in compliance with fundamental ethical principles'*. On this basis the European Commission carries out an ethics review of all FP7 applications (to be considered for funding) that raise ethical issues. **When non-EU countries are participating in the application procedures, proposers have to address the following issues:** use of local resources has to be justified and the proposed research should benefit the local communities.

The European Commission services have prepared an ethics guidance document specifically tailored to the needs of applicants when proposing research in non-EU countries. The document is available in Cordis (ftp://ftp.cordis.europa.eu/pub/fp7/docs/developing-countries_en.pdf).

African countries, such as Gabon and Senegal, have recently established their own Ethics Committees, not the least encouraged by their active participation in the European and Developing Countries Clinical Trials Partnership. An example in Annex 8 summarises how some of the practical aspects of these policies can be addressed.

4.1.2.9 *Investing in People: Marie Curie Actions*

The Framework Programmes' Marie Curie mobility schemes represent an interesting opportunity for Africa because there are no pre-selected priorities. Unfortunately, few African researchers utilised the scheme during FP6, in spite of the opportunities it offered for a period doing research in Europe.

FP7 offers a selection of actions aimed at researchers in different phases of their careers, as well as actions supporting participation by organisations and related research staff. All African countries are eligible as International Cooperation Partner Countries (ICPC).

There are very few restrictions on nationality, so African nationals who are already working on projects in the EU can now also apply for internal EU mobility fellowships.

The International Research Staff Exchange Scheme (IRSES) is designed to create linkages between excellent research centres outside the EU and their EU counterparts to provide specific opportunities for countries having a science and technology cooperation agreement. The application comprises a joint programme of exchange and research-related activities between the centres involved – researchers, technical staff and strategic planners are encouraged to organise a series of short-term secondments within the network. All North African countries and South Africa can currently participate and have done so successfully in quite a number of cases. The first 2008 call alone led to participation by 46 African institutions in 15 proposals. Of these, 41 were successful in 11 proposals. The successful bidders won support for a total of 869 African researcher-months in Europe and 727 EU researcher-months in Africa.

A slight upward trend is visible in both the number of individual scholarships awarded to African researchers for working in Europe, and those given to Europeans for research in Africa. African researchers can also access job opportunities in initial training networks, which are advertised in the EURAXESS portal ([19]).

4.2 IMPLEMENTING THE EIGHTH PARTNERSHIP

In the following summary, information is given on the projects under development or implementation to advance the Eighth Partnership on Science, Information Society and Space. The three huge areas addressed cannot be systematically covered and, for practical reasons, more emphasis is given to the first two.

Six of the projects are regarded as 'early deliverables', indicating that they are considered the most central to kick-starting African economic development; two in each component of the Eighth Partnership. The results could make possible major advances in:

- the African research grants;
- Water and food security in Africa;
- Africa Connect;
- African Internet Exchange System;
- The African Global Monitoring for Environment and Security (GMES-Africa);
- Implementation of the African Union Spatial Data Observatory.

What is behind the broad titles given to these Lighthouse Projects?

Under the Science priority two projects have been identified as follows:

- Up to EUR 15 million is available for consolidating the system of research grants in Africa out of the EDF. It is not hard to justify this funding – a strong research base advances social and economic development but it cannot be achieved without financial support for researchers themselves. The projects will also

[19] See http://ec.europa.eu/euraxess/index_en.cfm?l1=13&l2=3&initSearch=1 online.

support the AUC in overseeing the implementation of the grants.

Scientific research programmes in Africa need to be more robust, better coordinated and structured, and more integrated with programmes abroad. Of course, research conducted by Africans in Africa must also address the continent's needs. The research grants will allow the AUC to launch and monitor calls for proposals, introducing an Africa-wide, competitive, peer-reviewed research funding scheme and strengthening programme management in the AUC. They will also encourage African research teams to work together to present proposals and to cooperate in large consortia. Ultimately, the African Research Grants will prepare African research to meet head-on the challenges it faces.

- 'Water and food security' and 'Better access to health' are bundled in a specific FP7 'Africa call' worth EUR 63 million and is being jointly implemented through three Themes: Food, Agriculture, Fisheries and Biotechnology; Environment (including climate change); and Health. The call is focused on strengthening scientific capacity in Africa and addressing some of the S&T objectives under the EU-Africa Strategic Partnership.

Emphasis is on food security and health issues, taking into account broad socioeconomic issues such as migration, swelling urbanisation, climate change, food security and effective counteraction to malnutrition, as well as environmental issues like water conservation and management, including more effective reuse of wastewater, early warning systems for extreme weather conditions and support to policy dialogue to enhance targeting and uptake.

Malaria, HIV/AIDS, infant mortality, and insufficient resources and trained staff to carry out routine healthcare procedures continue to dominate Africa's health agenda. Forthcoming projects under the Health theme will address a series of priority topics in this context with particular emphasis on public health and healthcare delivery.

If global climate change continues at its current rate, warmer temperatures will not be the only concern in hotter climates. As conditions get harsher, a domino effect could trigger destabilisation through migration, conflicts over land and food, and rises in food and oil prices. So far, there have been no integrated efforts to consolidate water management policies with changing demographics and globalisation of food resources.

Two Lighthouse Projects come under the Information Society priority of the Eighth Partnership – AfricaConnect and African Virtual Campus ([20]) – are up and running. Both are extensions to SSA networks already operating in North Africa through European Neighbourhood Policy ([21]) funding, EUMedConnect ([22]) and UNESCO's Avicenna ([23]). The regional integration dimension is

[20] See http://www.unesco.org/science/psd/thm_innov/avc.shtml online.

[21] See http://ec.europa.eu/world/enp/index_en.htm online.

[22] See http://www.eumedconnect.net/ online.

[23] See http://www.unesco.org/science/psd/thm_innov/awos_july06_avicenne.pdf online.

just as important as are the two initiatives for the CPA and the African Regional Action Plan on the Knowledge Economy (ARAPKE).

- AfricaConnect has built bridges between existing and emerging national research and education networks in Africa and linked them to the European GEANT ([24]) backbone. A groundbreaking development for the African scientific community, researchers can, for the first time, interact with peers around the globe, and access scientific repositories and facilities including distributed computing systems. The connectivity study ended in October 2009 ([25]). A total of EUR 13 million has been provided through the 10th European Development Fund (EDF) for the first implementation phase starting in 2010.

- African Virtual Campus is a pan-African e-learning network interconnecting African universities. The project is implemented by UNESCO and was launched with the establishment of virtual campuses in 11 West African countries through preliminary funding from Spain.

The two Lighthouse projects in the Space segment are:

- The African Global Monitoring for Environment and Security (GMES) GMES Africa will reinforce Africa's use of and contribution to remote sensing science, especially building operational services for sustainable development. 'GMES Africa Action Plan' with detailed infrastructure needs, thematic priorities and financial instruments will be submitted to the third EU-Africa Summit, foreseen in 2010 in Libya.

- Capacity Building in the AUC on Geospatial Sciences The European Commission Joint Research Centre's Africa Observatory exploits geospatial science for sustainable development focusing on natural resources, food security, crisis management and renewable energies. Capacity building will identify modalities for implementing a mirror of the Observatory at AUC so as to increase the use of scientific information for decision making.

The African Union and European Commissioners responsible for science and technology agreed on some basic and general principles for the implementation of the Eighth Partnership Action Plan:

- the need to apply scientific knowledge and engineering know-how to economic growth, social progress and sound policy decisions;

- the need to combine a thematic approach, based on encouraging centres of excellence, with broader capacity-building;

- the need to use centres of excellence to create high aspirations amongst African researchers and engineers, and to inspire students;

- the need to generate some short-term results, but within a coherent and coordinated long-term vision and strategy;

- the need to adapt to local needs and constraints, to build sustainability, and to involve the Diaspora;

- the need to involve the respective Member States and the Regional Economic Communities.

[24] See http://www.geant.net/ online.

[25] See http://www.feast-project.org online.

5. LOOKING TO THE FUTURE

The preceding sections outlined the policy framework and its principal mechanisms and S&T priorities. This framework ensures that the projects undertaken become mutually reinforcing building blocks to achieving the ambitious agenda.

Scientific cooperation has been ongoing for several decades. The results from past and ongoing collaborations constitute significant potential, but the scale of these results has often been modest compared to the needs.

In the future, we need to develop the synergies between actions taken at the EU level and those taken at Member State level. There are two fora which may contribute to achieving this:

- The EU Expert Group for the EU-Africa Strategic Partnership in S&T
- The Strategic Forum for International Cooperation (SFIC)

These fora may serve to share information and experiences, coordinate policy and possibly identify joint future priorities.

The challenge is to be more effective in the different key areas of science and technology (S&T) that address basic needs of sustainable development and to do so in a better informed and coordinated manner. Anchoring these international scientific and technological collaborations in policy-driven demand of African countries themselves is one of the most effective ways of increasing the impact of these efforts. The existence of the Eighth Partnership and the combined commitment of the parties responsible for public policy augur well for the future.

Ultimately, the appearance of tangible effects on the ground depends not only on high-quality and well-targeted research cooperation but also on the framework conditions in place such as:

- investment in people and institutions;
- the policy environment for the creation, organisation and more systematic use of scientifically validated knowledge;
- the general communication infrastructure to make sure that ideas, people, products and services can circulate more freely;
- implementation of key policies.

These framework conditions depend on the political priorities of African countries themselves.

With the entry into force of the Lisbon Treaty, 1 December 2009, the creation of a High Representative for Foreign and Security Policy/ Vice_President of the Commission is intended to promote EU action on the international scene and will affect the context of international scientific cooperation as well.

The European Commission remains very committed to cooperation with Africa in Science and Technology and firmly believes in the potential of S&T to contribute to the achievement of the Millennium Development Goals and to economic growth and social prosperity in the continent.

ANNEXES - FROM POLICY TO ACTION: COLLABORATIVE RESEARCH PROJECTS

ANNEX 1
FOOD SECURITY, AGRICULTURE AND ANIMAL PRODUCTION

ANNEX 1.1

PROJECTS FOCUSED ON UNDERSTANDING THE MECHANISMS OF KEY CROPS IN SEARCH OF VARIETIES AND/OR FARMING APPROACHES THAT HELP MANAGE ABIOTIC STRESS, SUCH AS DROUGHT:

OPTIWHEAT ([26]):
Duration: 01/07/2006 to 30/06/2010,
EU funding: EUR 1.8 million, FP6

TRITIMED ([27]):
Duration: 01/09/2004 to 31/08/2008,
EU funding: EUR 1.3 million, FP6

[26] See http://www.rothamsted.ac.uk/cpi/optiwheat/indexcontent.html online.

[27] S eehttp://www.rothamsted.ac.uk/cpi/tritimed/indexcontent1.html online.

As the threats of climate change loom large, forecasters predict that water – already a precious and dwindling resource in eastern and southern Mediterranean Basin countries – will become even scarcer in the coming decades. Agriculture currently accounts for about 75% of fresh water consumption in these countries. Crop yields, particularly those of durum wheat – the most cultivated grain in the region – must be improved as the population continues to grow. At present, crops in this region are at the mercy of frequent droughts, resulting in constant fluctuation in production rates and uncertainty of supply, even under conditions of functioning trade, which might compensate for local shortfalls.

Two consortia, OPTIWHEAT ('Improving the yield stability of durum wheat under Mediterranean conditions') and TRITIMED ('Exploiting the wheat genome to optimise water use in Mediterranean ecosystems'), have developed new types of wheat cultivars that are more tolerant to drought and can produce more stable yields in drought conditions.

Research strategies deployed by the OPTIWHEAT and TRITIMED partners have identified variations in the germplasm of durum wheat by using genomics, classical genetics, agronomy and crop physiology data. The selected wheat breading lines have shown improved tolerance to drought.

The projects' complementary aims include a socioeconomic study of farming conditions in the region, and training and development for young scientists from North Africa and West Asia.

In addition to the development of drought-tolerant wheat, the projects' long-term aims include an improved research infrastructure in Africa, data for trials to test the new lines of wheat, the dissemination of knowledge on new molecular and physiological techniques and the latest scientific tools, and clear identification of problems in wheat farming, particularly of those related to water use. This is in recognition of the fact that the best experimental results still need to pass the harsh test of practice before one might expect broad-based uptake in real farming systems. The projects have covered for that, at least partially, by involving young scientists from the region who are now better informed about state-of-the-art research methods, and will help build a more robust scientific research knowledge base that farmers and extension services can draw upon.

The consortia are coordinated by Rothamsted Research in the UK and mobilise teams from Italy, Jordan, Morocco, Spain, Syria and Tunisia.

ANNEX 1.2

ADDING VALUE TO BIODIVERSE AND BIO-SAFE CROPS

1.2.1 BAMLINK

Duration: 01/01/2006 to 31/12/2009,
EU funding: EUR 1.5 million, FP6

Bambara groundnut is a traditional underutilised food plant in Africa that can contribute to food security for some of the world's poorest people. Bambara groundnut is highly nutritious, protein-rich and drought-tolerant. Previous INCO projects in FP4 and FP5 confirmed the food plant's potential.

BAMLINK ('Molecular, environmental and nutritional evaluation of Bambara groundnut for food production in semi-arid Africa and India') ([28]) brings together 10 partners from Africa, Europe and India in a project that combines molecular, environmental and nutritional studies, and end users of Bambara groundnut.

Partners have selected and tested the first varieties of the crop, and best farming practices in different ecosystems. They have also selected a range of products suitable to local food security. The genetics underlying nutritional and processing value have been assessed and novel products are being developed through small and medium-sized enterprises (SMEs).

The project is coordinated by the University of Nottingham in the UK. Partner teams come from Botswana, Denmark, Germany, Ghana, India, Namibia and Tanzania.


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1.2.2 INSTAPA

Duration: 01/06/2008 to 31/05/2012,
EU funding: EUR 5 million, FP7

Malnutrition and particularly micronutrients deficiencies put at risk the well-being of women and children in Sub-Saharan Africa (SSA). Researchers are working to identify novel staple food-based approaches that could resolve this problem.

A case in point is the INSTAPA ('Novel staple food-based strategies to improve micronutrient status for better health and development in Sub-Saharan Africa') ([29]) project, which combines the expertise and know-how of 11 research institutes from Africa, Asia, Europe and North America to investigate ways of reducing deficiencies in micronutrients such as iron, zinc and vitamin A.

Improving the micronutrient content of several staple African foodstuffs – cassava, millet, sorghum and maize – is the target. Tests are assessing the genetic potential of staple foods for increasing the micronutrient and anti-nutrient content of these foods. The determinants of success and failure of introducing bio-fortified staple foods into local farming systems will be assessed.

[28] See http://research.nottingham.ac.uk/newsreviews/newsDisplay.aspx?id=182 online.

[29] See http://www.instapa.org/instapa online.

The developed approaches in the area of bio-fortification, fortification and processing will be compared in relation to efficacy of improving iron and zinc intake and status. The safety of the improved staple foods on immunity and infections will be evaluated, as will the impact of the new fortified foods on malnutrition levels and on the cognitive development of young children. INSTAPA has the potential to significantly improve the health of African women and children living in areas where resources are scarce.

Through capacity building and strengthening of scientific and technological excellence in the field of staple food-based approaches in Africa and Europe, the project seeks to significantly contribute to improving the dietary quality of young children and their mothers living in resource-poor areas in SSA. New scientific knowledge will be exploited to strengthen the competitiveness of local SMEs targeted at evidence-based production of healthier (complementary) foods for African children.

The INSTAPA project is coordinated by Wageningen Agricultural University in the Netherlands. Partner teams come from Benin, Burkina Faso, France, Kenya, Mali, Nigeria, South Africa, Switzerland, the UK and the US.

ANNEX 1.3

ANIMAL HEALTH

EPIGENEVAC:
Duration: 01/07/2005 to 30/06/2009,
EU funding: EUR 1.2 million, FP6

Ticks transmit the pathogen *Ehrlichia ruminantium* which causes cowdriosis (i.e. heartwater), and the parasite *Anaplasma marginale* that causes anaplasmosis. These infections of ruminants belong to a group of animal diseases of major economic importance in tropical and sub-tropical regions. Their presence is an obstacle to the international trade of animals.

By controlling these diseases, the EPIGENEVAC ('Epidemiology and new generation vaccines for *Ehrlichia* and *Anaplasma* infections of ruminants') ([30]) project aimed at contributing to an increase of livestock productivity, reducing the use of acaricides for vector control and developing sustainable production systems which respect the environment and enhance food safety.

[30] See http://www.ist-world.org/ProjectDetails.aspx?ProjectId=1a2cfff366b24bac8dbcfa0c7809ccc1&SourceDatabaseId=7cff9226e582440894200b751bab883f online.

The EPIGENEVAC consortium developed a multi-pathogen diagnostic test for extensive use in epidemiological studies at the regional level, applied modern genomic techniques to develop next generation multi-component vaccines against the pathogens that cause the diseases and evaluated the efficacy, impact and cost-effectiveness of the vaccines developed in well-characterised farming systems.

The vaccine, together with new products for diagnosis, will help improve animal health and longevity in SSA, thus contributing to poverty reduction. The scientific and technical networking contributes to strengthening the research capacity of partners, particularly in SSA.

Numerous publications disseminating information on the diseases and methods to mitigate them is yet one more lasting result to come out of the consortium's research, and results feed into web updates on emerging and exotic animal disease control, including avian influenza ([31]).

The 11 EPIGENEVAC partners are coordinated by the International Cooperation Centre in Agricultural Research for Development (CIRAD) in France and include teams from Gambia, Uganda and the UK.

[31] See http://avian-influenza.cirad.fr/projects/surveillance/mesures_d_urgence online.

ANNEX 2
SUSTAINABLE USE OF NATURAL RESOURCES

ANNEX 2.1

WATER IS A MAJOR CROSS-CUTTING CHALLENGE IN AGRICULTURE AND OTHER HUMAN CONSUMPTION AND FOR MAINTAINING ECOSYSTEM FUNCTIONS

2.1.1 WASAMED

Duration: 01/01/2003 to 31/12/2006,
EU funding: EUR 1.5 million, FP5

The WASAMED ('Water saving in Mediterranean agriculture') ([32]) project established a Mediterranean-wide platform for dialogue on water conservation between scientific researchers and policy makers from the EU and the Mediterranean Basin countries. The thematic network effectively links water conservation research to the needs of the region.

Easy-to-use databases were set up for knowledge dissemination, and a regional planning framework was established to plan water management in the region. Such measures targeted better coordination and management of fresh water resources in the region. WASAMED also established Mediterranean-wide research networks, organised a major international water resources management conference and conducted a series of five workshops in Egypt, Jordan, Lebanon, Tunisia and Turkey.

The 38-strong WASAMED consortium contributed significantly to the regional and multi-stakeholder dialogue on agricultural water management, emphasising the need to make water management more functional with respect to the main sustainability principles: ecosystem protection, water system governance, better and equitable access to water resources, eco-efficient water management (more balanced trade-offs between economic and environmental dimensions), system competitiveness and democratic co-decision processes. It also leaves behind an extensive number of reference publications.

Coordinated by the Istituto Agronomico Mediterraneo di Bari – Centre International de Hautes Etudes Agronomiques Méditerranéennes in Italy, the project partners came from Algeria, Cyprus, Egypt, Gaza/West Bank, Germany, Greece, Jordan, Lebanon, Malta, Morocco, Portugal, Spain, Syria, Tunisia and Turkey.

[32] See http://wasamed.iamb.it/programmi/home.php online.

2.1.2 AQUASTRESS

Duration: 01/02/2005 to 31/01/2009,
EU funding: EUR 10.3 million, FP6

Lack of access to fresh water is an escalating problem, particularly in developing countries of the Mediterranean Basin where water is needed for development. However, this problem is further exacerbated by the fact that some types of development reduce the amount of fresh water available for other activities.

The AQUASTRESS ('Mitigation of water stress through new approaches to integrating management, technical, economic and institutional instruments') ([33]) Integrated Project investigated methods for improving water management in the Mediterranean region in order to encourage sustainable development options. The project developed European and Mediterranean approaches to water sustainability and designed actions that can lead to a more flexible approach to water management throughout the region. Such an approach can help communities adapt to a changing natural and socioeconomic environment.

In a region where hierarchical approaches to management are common, the project encouraged a more decentralised approach to water management and conservation so as to harness a larger and more diverse knowledge and skill pool for innovative solutions. AQUASTRESS developed new knowledge-based management tools to support research methods and proposed a series of implementation options for future good practice in water management throughout the region.

The extensive AQUASTRESS consortium was coordinated by Consiglio Nazionale delle Ricerche in Italy, bringing together 36 teams from 16 countries: Belgium, Bulgaria, Cyprus, Denmark, France, Germany, Greece, Hungary, Italy, Morocco, the Netherlands, Poland, Portugal, Spain, Tunisia and the UK. It leaves an important legacy of publications and experimental work on bringing research approaches and results to stakeholders across the Mediterranean and North African region.

[33] See http://www.aquastress.net/ online.

ANNEX 2.2

FUNCTIONING TERRESTRIAL ECOSYSTEMS DELIVER SUSTAINABLE PRODUCTS AND SERVICES

SUN:
Duration: 01/01/2007 to 31/12/2009,
EU funding: EUR 2.5 million, FP6

Natural vegetation of arid and semi-arid West Africa is an essential contributor to local people's daily subsistence and nutrition, economic benefits and survival during hunger periods. However, poor management and unsustainable use are advancing its deterioration. One of Africa's development challenges is to establish a link between global initiatives and local management actions and make available to decision makers options for improved management strategies. This is where SUN enters the picture.

SUN ('Tools for management and sustainable use of natural vegetation in West Africa') ([34]) is a 10-partner consortium of scientists from Europe and West Africa. It combines interdisciplinary research on vegetation dynamics with the development of new decision-support tools as well as low-budget management and restoration actions through participatory approaches between scientists and local people.

SUN gathers unique experts from West Africa and Europe in the fields of vegetation ecology, socio-economy and ethno-ecology who are setting up a knowledge and technology platform for vegetation management in West Africa. A total of 17 African PhD students have been involved in this project.

SUN is coordinated by the University of Aarhus in Denmark. Other teams come from Burkina Faso, Germany, Italy, Niger and Senegal.

ANNEX 2.3

RECONCILING MULTIPLE DEMANDS ON COASTAL ZONES

Reconciling the multiple demands on coastal zones is a challenge springing from the Johannesburg Plan of Implementation ([35]), adopted at the World Summit on Sustainable Development in 2002 ([36]). Responses have included a cluster of international research collaborations that explore opportunities and obstacles for achieving time-bound targets. The EU and Africa are committed to ensuring global sustainable development, and do so by targeting economic development, social development and environmental protection. The challenge is on, and they are set to deliver.

[34] See http://www.sunproject.dk/ online.

[35] See http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIToc.htm online.

[36] See http://www.un.org/jsummit/html/basic_info/basicinfo.html online.

INCOFISH:
Duration: 01/05/2005 to 30/04/2008,
EU funding: EUR 4.9 million, FP6

Overfishing is a serious problem worldwide. Dwindling fish stocks are partly a result of the over-harvesting of juvenile fish, both by local fishing fleets and by international trawlers that scrape the sea bed, scooping up fish indiscriminately. Huge numbers of fish are caught before they have a chance to mature and reproduce. Studies have shown that wild fish catches could be up to seven times larger if fish were harvested after they have spawned at least once.

Many of Africa's once abundant waters are being seriously depleted as international fleets compete with local fishermen for fish that are then sold on European and Asian markets. This problem is particularly acute around Senegal. Thousands of Senegalese fishermen are harvesting smaller and smaller catches that can barely support their families.


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The INCOFISH ('Integrating multiple demands on coastal zones with emphasis on aquatic ecosystems and fisheries') ([37]) project had reconciling the conflicting demands on coastal zones as its raison d'être. These demands include the need to produce more fish for the growing population, the necessity of rebuilding declining stocks, and the problems caused by ocean tourism. In competition with these are the need to create local jobs and prosperity, pollution and the need to continue development of the ocean environment sustainably, particularly restoring fishery resources to healthy levels.

INCOFISH generated information and tools that can be used easily in everyday life. One outcome with immediate application used easily in everyday life is a series of foldable plastic 'rulers'. The rulers have pictures of the most common fish from a particular region and a measurement scale showing how long a mature specimen of each type should be. There is also an online version of the rulers with clickable icons that provide the same information as a simple but effective way for both consumers and fishermen to be sure that the fish they are buying or catching are mature and have reproduced at least once. Different versions of it have been created for different parts of the world, but Senegal is the first African country to start using it.

[37] See http://www.incofish.org online.

The slogan 'Don't Eat Babies', together with support to help producers and consumers make alternative choices could help forge links between political priorities and new practices on the ground. Such is the success of INCOFISH that several European companies and industry associations that import fish have sought the consortium's advice on sourcing their produce sustainably.

For the African partners, benefits included the chance to work together on cross-ecosystem comparisons using ecological software modelling systems. These have provided a solid basis for them to test ecological hypotheses and strategies of fisheries management.

Participants also developed skills in mapping and GIS (geographic information system) planning, and compiled data on alternative livelihoods for fishers (research was carried out, for example, on sea cucumbers – a highly valuable bottom-dwelling animal in Kenya that is currently undervalued in the country). Other results include important analyses of fish stocks and biodiversity, and maps showing the current and predicted levels of biodiversity in the oceans affected by overfishing and climate change.

The project's combination of these 'environmental' analyses with in-depth studies of selected countries' legal and regulatory systems was another innovative aspect of INCOFISH. It allowed an assessment of whether global legal and political commitments on sustainable coastal zones and seas were translated into the national regulatory and incentive frameworks. This aspect is crucial as the best intentions will not lead to changes in practice, if laws, regulations and rules do not support sustainable use over short-term resource mining.

The 36 INCOFISH partners came from 23 countries in Africa, the Americas, Asia and Europe. The four African partners were from Kenya, Namibia, Senegal and South Africa. The project was coordinated by the Leibniz Institute for Marine Sciences in Kiel, Germany. The project was selected as one of the Star projects in FP6 and showcased in EuroNews ([38]).

ANNEX 2.4

CLIMATE CHANGE IMPLICATIONS ON AFRICAN REGIONS

AMMA:
Duration: 01/01/2005 to 31/12/2009,
EU funding: EUR 13 million, FP6

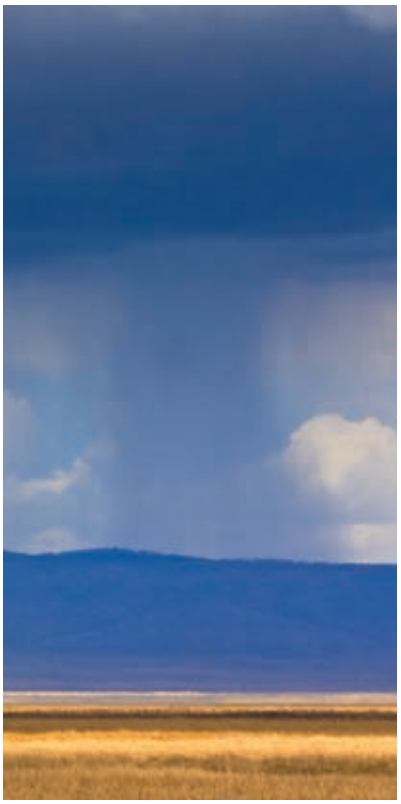
West Africans used to welcome the monsoon that arrived in May; its rains nourished the parched ground stimulating the growth of crops and providing fresh water for millions of people. Since the 1970s, however, the course of the monsoon has become more erratic causing dry spells that wreak havoc on the environment and on the livelihoods of the people who depend on agriculture. Researchers estimate that a rapidly growing population in the coming decades, coupled with drought conditions, could cause more severe socioeconomic strain.

If scientists are able to make accurate diagnoses about the course of the West African monsoon, then they can accurately forecast imminent dry spells. The AMMA ('African Monsoon Multidisciplinary Analysis') ([39]) project sought to gather enough data to provide African policy makers with reliable assessments of changes in the monsoon rains. They looked at natural fluctuations in weather patterns and climate change.

[38] See http://www.euronews.net/2008/06/06/fishing-for-tomorrow/ online (also in other languages).

[39] See https://www.amma-eu.org/ online.

During the course of AMMA, more than 140 European, Asian and African laboratories compiled data to fuel understanding of the causes of the monsoon fluctuations. They monitored the rain patterns over the course of two years and found that the formation of cold water in the Gulf of Guinea plays an important role in their onset. The effects of carbon pollution on the monsoon variation were another research topic.



Data collected during the project and from joint collaborations have led to a better understanding of the mechanics of the monsoon. The project partners are now able to anticipate that more accurate predictions of its course will be possible in the coming years.

Acquiring new knowledge on factors with such wide-ranging implications for our understanding of crop cycles, sea and air transport conditions, weather patterns and much more can only be achieved through broad-based international scientific cooperation. These investigations allow researchers to ask ever-more pertinent questions for untangling the complex interaction of factors influencing the changes in monsoon patterns. They have made extensive progress in learning how to extract the answers. Connecting these broad-based trend analyses to ground realities at smaller spatial and temporal scales remains a challenge. Yet, this huge collaboration has pushed the frontiers of our understanding further ahead towards some interesting applications.

ANNEX 3
HEALTHIER SOCIETIES

ANNEX 3.1
THE EUROPEAN AND DEVELOPING COUNTRIES CLINICAL TRIALS PARTNERSHIP (EDCTP)

Duration: 2003 to 2010,
EU funding: EUR 200 million, FP6 plus at least the same amount of funding from European partners

HIV/AIDS, Malaria and Tuberculosis (TB) are the big three killer diseases in SSA, responsible for over six million deaths each year, and the numbers are growing. They cause devastation to families and put a huge financial burden on those left behind. Trying to escape the disease-poverty-disease cycle is impossible for people looking after sick relatives who cannot work. Children often go to work to make sure the family has an income and thus miss out on school, further perpetuating the poverty cycle.

The implementation of long-term coordinated programmes is crucial if problems associated with disease in SSA are to be curbed. The programmes will create health centres with properly trained staff who can keep registers of patients who are receiving treatment. Malaria and TB are both curable diseases, but a patient must follow a consistent course of treatment if it is to be effective. Failure of patients in developing countries to complete their treatment is frustrating – aid programmes have limited funds.

The European & Developing Countries Clinical Trials Partnership (EDCTP) ([40]) was created in 2003 as a European response to the global health crisis caused by the three main poverty-related diseases of HIV/AIDS, Malaria and Tuberculosis. Sub-Saharan Africa is the world's worst-affected region.

EDCTP is currently a partnership of 14 EU Member States plus Norway and Switzerland (both associated with FP6 and FP7) with all Sub-Saharan countries. It helps European countries to coordinate their own research efforts and all its projects are carried out with African countries. All European members contribute financially and in kind to the overall budget under Article 169 of the Treaty. Other public and private contributions are also sought to further increase the impact of the partnership's activities.

[40] See http://www.edctp.org/ online.

The EDCTP objectives

The EDCTP is determined to quash this problem by accelerating the development of new and/or improved drugs, vaccines and microbicides that will stop these diseases in their tracks. A priority is getting drugs and vaccines into developing countries under conditions and at prices that are affordable, but their cost is difficult to ignore, and pharmaceutical companies need to make a profit if they are to stay in business. The solid collaboration between all EDCTP partners and their African peers will bridge the gap between what patients require and what enterprises and healthcare systems can provide.

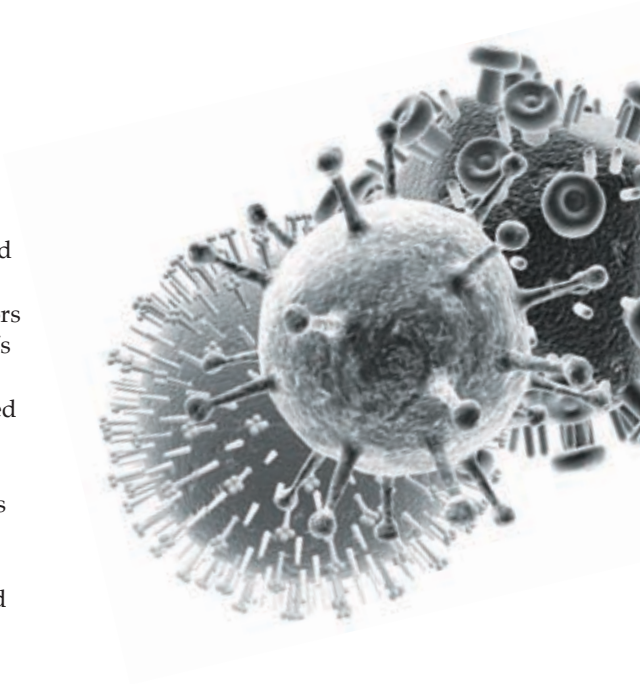
The EDCTP should not be seen as development aid, but as a crucial step in helping Africa to lift itself out of the poverty cycle and to bloom economically. Fruitful results will emerge thanks to the support afforded by scientific and political figures and educational and research institutes in Africa.

Expected and obtained results

A solid collaboration fuels the transfer of knowledge and exchange of resources, with people benefiting from improved healthcare in Africa being the ultimate winners. African doctors and scientists are on the project's steering committee and the EDCTP partners have established strong foundations for future collaborative research projects between the EU and Africa. This is done through participation in regular exchange programmes between academic institutes and educational establishments.

Moreover, the establishment of networks of clinics and reference laboratories is strengthening basic health infrastructure. The EDCTP is supporting capacity building that will make it possible to carry out clinical trials for HIV/AIDS, and the project is taking steps to create a better regulatory and legal framework for future clinical trials.

Other expected results include a new, shared pool of resources, such as funding agencies, new networks of training facilities, incentives for joint capacity building, sponsoring for workshops and meetings, and coordinated research activities.



The EDCTP is expected to secure further support under FP7 after 2010, allowing it to continue its quest for better care and protection for Africans.

The projects, which are not part of the EDCTP presented below, represent a cross-section of other international collaborations that have delivered results in the past and continue to do so.

ANNEX 3.2

TRANSLATING POLICY INTO ACTION FOR HEALTH SYSTEM RESEARCH

SURE:
Duration: 01/06/2009 to 31/05/2014,
EU funding: EUR 2.9 million, FP7

If health policies are to have a positive impact on the people and places where they are most needed, it is crucial that reliable health research information becomes available to them. Failure to gain access to and use of research information by decision makers and policy makers hinders the effectiveness of services afforded to those who need it most.

The SURE ('Supporting the use of research evidence for policy in African health systems') ([41]) project is working to improve access to and use of important research information and statistics for policy makers. SURE will develop, pilot and evaluate five strategies to give health policy makers in Africa easier access to vital health information.

The strategies have user-friendly formats for the creation and storage of reliable research information, clearing houses for policy relevant research, methods for organising policy-relevant forums for all stakeholders and advice on how to involve civil society in policy making.

SURE is coordinated by Nasjoalt Kunnskapssenter for Helsetjenesten in Norway, mobilising partners from Burkina Faso, Cameroon, Canada, Ethiopia, France, Mozambique, Sweden, Switzerland, Uganda and Zambia. SURE is building on the work of two existing initiatives: REACH ('Regional East African Community Health') and EVIPNet ('Evidence-Informed Policy Network').

REACH, in development since 2001, is an integrated institutional mechanism operating within the East African Health Research Commission (EAHRC). This is a semi-autonomous institution of the East African Community (EAC) and includes Burundi, Kenya, Rwanda, Tanzania and Uganda. REACH's mission is to gather and disseminate accurate health information for informing and influencing health policy.

The EVIPNet programme has built on the work of REACH. It was launched by the World Health Organization (WHO) and several ministries of health in African and Asian countries to promote the use of scientific research in health policy making in SSA, Latin America and Asia. EVIPNet operates in the form of a partnership between policy makers, civil society and scientific researchers who are dedicated to providing high-quality research evidence to support health policy making.

[41] See http://www.who.int/rpc/news/evipnet_uganda/en/index.html online.

ANNEX 4
DEVELOPMENT OF ENERGY AND INDUSTRIAL PROCESSES IN AFRICA

ANNEX 4.1
AGRO-FORESTRY AND OTHER SOURCES OF RENEWABLE ENERGY

COMPETE:
Duration: 01/01/2007 to 31/12/2009,
EU funding: 1.5 million, FP6

One of the issues foremost on the minds of Europeans these days is protection of the environment. This sense of urgency is increasingly shared elsewhere. Authorities in political and industrial spheres more or less agree that the world must change how energy is generated and consumed. The transition from fossil fuel production and use will not happen overnight, but the consensus on its necessity will help.

The COMPETE ('Competence platform on energy crop and agro-forestry systems for arid and semi-arid ecosystems') ([42]) project is encouraging the implementation of bio-energy in arid and semi-arid regions of Africa by creating a platform for dialogue among stakeholders.

Data show that biomass energy production activity can have positive and adverse effects on both the environment and biodiversity. Africa has large regions available for biomass production, but sensitivity and foresight must be used in development in order to ensure positive effects on local livelihoods. The correct approach will minimise impact on the environment and precious water resources.

The project consortium brings together 44 partners from 5 continents, 18 of which are from 8 European countries and 13 from Africa including Botswana, Burkina Faso, Kenya, Mali, Senegal, South Africa, Tanzania and Zambia. The teams, from universities, research centres, international organisations and associations, are conducting a comprehensive assessment of African land available for biomass production taking into account its current use and the amount of water available for irrigation. The project is coordinated by WIP KG in Germany.

The results of the assessment, collected from numerous studies and workshops, are already available on the project web site. Publications and best practice material from previous projects are accessible and will provide prospective stakeholders with essential knowledge of biomass production potential in the arid and semi-arid areas of Africa.

[42] See http://www.compete-bioafrica.net/ online.

ANNEX 4.2

INDUSTRIAL PROCESSES AND MATERIALS SEEKING TO MINIMISE ENVIRONMENTAL IMPACT

BIOMINE:
Duration: 01/11/2004 to 31/10/2008,
EU funding: EUR 11.5 million, FP6

Increasing pressure from politicians and environmental groups for cleaner industrial production methods, coupled with the need for European industry to be more economically competitive, led to the development and implementation of the BIOMINE ([43]) project. BIOMINE ('Biotechnology for metal bearing materials in Europe') investigated cleaner and more efficient ways for the recovery of metals from primary materials such as ores and concentrates, as well as from secondary materials like mining waste.

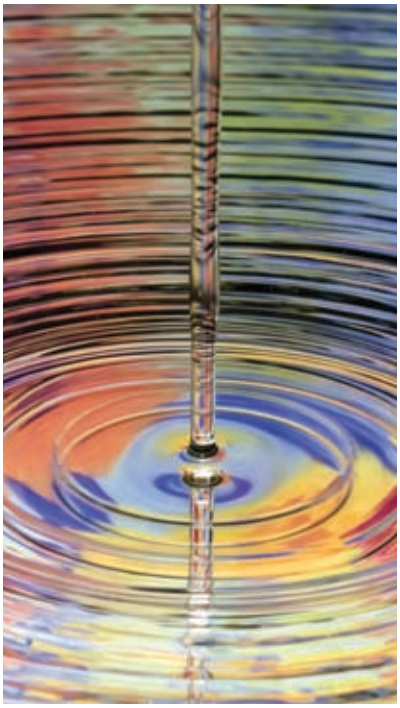
Curtailing environmental pollution from the production process could receive a boost from research exploring novel methods for producing metals from primary or secondary materials. Implementation of increasingly stringent environmental laws and compliance by industry, as well as industry-driven standards, would help drive this objective.

A total of 40 European and South African academic and industrial partners joined forces under the coordination of BRGM in France to research biotechnologies, such as bio-accumulation, bioflotation, bioreduction and bioleaching, and to explore the potential of microbiology. The techniques investigated their potential to integrate into processes in the materials industry and are expected to produce radical changes leading to renewable materials, less waste and more economical production methods – even at smaller scales.

Many of the consortium partners were from South Africa, which is currently a world leader in metal and mineral extraction. BIOMINE also undertook training activities to disseminate knowledge of relevant new techniques in South Africa.

BIOMINE's research will lead to new techniques for metal and mineral extraction that can replace traditional and highly polluting methods such as roasting and smelting. This will bring about more economical and environment-friendly ways of metal production, particularly regarding the extraction of ore materials. Consequently, costs and energy demands will drop and revenues will rise.

The competitiveness of the industry will go from strength to strength due to dissemination of knowledge and training in biometallurgy methods, particularly throughout South Africa. The new knowledge will enable the industry to reduce costs and comply with environmental standards. For its part, the public will set its sights on more sustainable production.



[43] See http://biomine.brgm.fr/project_project.asp online.

ANNEX 5
INTEGRATING AFRICA INTO THE KNOWLEDGE SOCIETY OF THE FUTURE

IRMA:
Duration: 01/06/2008 to 31/05/2011,
EU funding: EUR 2.4 million, FP7

Africa has a poignant history of emergencies and disasters, both natural and manmade. Disasters can devastate regions that may have just begun to grow economically, thus throwing them back into a poverty cycle.

A systematic 'disaster management platform' may help African nations to better prepare for and manage disasters and emergencies, thus supporting the continent's gradual economic growth. Improved preparedness and management would also alleviate the burden on EU and other international emergency programmes.

While disaster strategies exist already in Africa, they are often limited in scope. Differences between specific areas and cultures, and possible 'domino effects', where one disaster triggers another, are often left out of plans.

A disaster management and anticipation strategy is most effective when several conditions are met: knowledge about local conditions; institutional arrangements that enable different public and private actors to combine their diverse capabilities with state-of-the-art equipment; and technology that can predict or possibly prevent disaster – and in a worst-case scenario deal with it in the fastest and most efficient way possible.

Good relations among local, national and international organisations and functioning communication channels also facilitate the most productive results.

IRMA ('Integrated risk management for Africa') ([44]) will use the latest state-of-the-art information communication technology (ICT) tools to create a complete system for disaster management, taking into account all the diverse regions and cultures of Africa.

The latest ICT tools and techniques will be incorporated into a reference infrastructure and an access platform that will be up and running by the end of the project. They will be used for risk management and are equipped to deal with all phases of both natural and man-made disasters. They will be developed partly by building on the achievements of previous FP6-funded risk management projects such as SANY ('Sensors anywhere') ([45]) and ORCHESTRA ('Open architecture and spatial data infrastructure for risk management') ([46]).

IRMA will also enhance the availability of disaster communication services in Africa by encouraging the use of all available networks and by using research results to demonstrate how ICT systems can help deal with a wide range of natural and man-made disasters efficiently and at a low cost.

The consortium is coordinated by the University of Luxembourg and mobilises partners from Cameroon, France, Morocco, Mozambique, the Netherlands, Senegal, South Africa and Tunisia.

[44] See http://www.irma.lu/ online.
[45] See http://sany-ip.eu/ online.
[46] See http://www.eu-orchestra.org/ online.

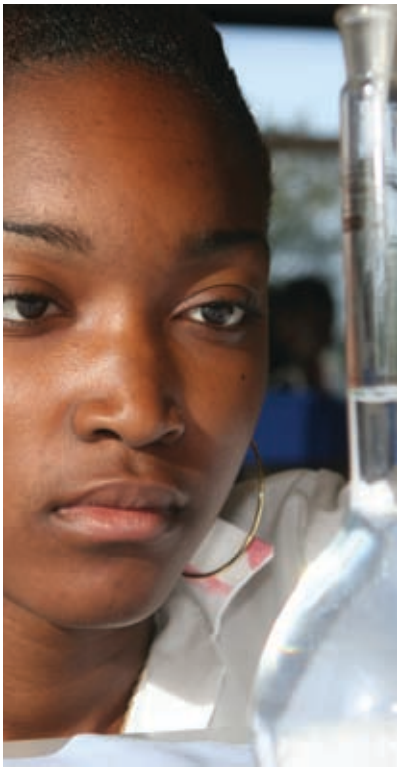
ANNEX 6
DEMOGRAPHY AND SOCIETAL CHALLENGES

ANNEX 6.1
INTERNATIONAL COLLOQUIUM ON GENDER POPULATION AND DEVELOPMENT IN AFRICA

Duration: **01/01/2001 to 30/06/2002,**
EU funding: **EUR 60 000, FP5**

GENDERPOP-AFRICA supported the organisation of an international colloquium entitled 'Gender, Population and Development in Africa' in Abidjan, Côte d'Ivoire in 2001. Its objective was to compile the results of years of research conducted in SSA countries and in North Africa on gender systems and their interrelations with population and development issues, as well as on capacity building involving African and European nations. The colloquium promoted the exchange of knowledge between English and French-speaking researchers, as well as between African scholars and Africanists from other continents.

It also aimed to put these results at the disposal of decision makers, field operators and staff in training. This would ensure that key findings are incorporated in work routines and make certain that findings on gender influence the practice of statistical offices and demographic work. Through publications and follow-up work, this small support action yielded big results.



More than 100 researchers and field workers made contributions, and nine sessions dealt with notional and methodological developments, rights, gender inequalities in production, migration, health and education and gender relations.

The project was coordinated by INED in France in collaboration with several statistical services and research outfits in countries bordering the Gulf of Guinea. It had valuable synergies with bilateral cooperation of several EU Member States and stimulated pertinent follow-up activities in research.

6.1.1 DIASPEACE

Duration: 01/03/2008 to 28/02/2011,
EU funding: EUR 1.4 million, FP7

DIASPEACE ('Diasporas for peace: patterns, trends and potential of long-distance Diaspora involvement in conflict settings. Case studies from the Horn of Africa') is carrying out research on the role that Diaspora communities play in influencing activities in their home countries.

DIASPEACE seeks to generate policy-relevant, evidence-based knowledge on how Diasporas (exiled populations from conflict regions) play into the dynamics of conflict and peace in their countries of origin. The project has an empirical focus on Diaspora networks operating in Europe which extend their transnational activities to the Horn of Africa. This is a region where decades of violent conflict have resulted in state collapse and the dispersal of more than two million people. The project will conduct field research in seven European countries and in Ethiopia, Eritrea and Somalia.

In a globalised world diasporas have become new forces shaping the interactions between countries, regions and continents. On one hand, they are seen to fuel conflict by transferring remittances and logistic support to the warring parties, and to exacerbate tensions through radical mobilisation along ethnic and religious lines. On the other hand, Diaspora groups are playing an increasingly prominent role in peace and reconciliation processes. There is a need for a balanced empirical account of the nature, motivations and impact of transnational Diaspora activities in conflict settings.

DIASPEACE aims to:

- devise and test methodologies of multi-sited comparative research, and to develop the conceptual framework for researching migrant political transnationalism in a conflict context;
- facilitate interaction between Diaspora and other stakeholders in Europe and in the Horn of Africa;
- provide policy input on how to better involve Diaspora in conflict resolution and peace-building interventions, and how to improve coherence between security, development and immigration policies.

The consortium involves six partners from Europe and two from the Horn of Africa bringing together interdisciplinary expertise from the fields of conflict analysis, migration studies and anthropology, among others.
The project is coordinated by the University of Jyväskylä in Finland. It is formed by teams from Ethiopia, Finland, Germany, Italy, the Netherlands, Norway and Somalia.

ANNEX 7
CULTURAL HERITAGE

SHADUF:
Duration: 01/07/2004 to 30/06/2007,
EU funding: EUR 1.1 million, FP6

The twin threats of drought and climate change are forcing the world's population to think about ensuring enough water for all its needs. While water levels are sinking, the demands for water from industry, agriculture, urban development and the growing population are rising. It is now vital that we take a more innovative and inventive approach to water management. The SHADUF ('Traditional water techniques: cultural heritage for a sustainable future') ([47]) project studied alternative methods for water conservation and collection, adapting traditional techniques to today's socioeconomic context. Many ancient methods of water collection and distribution were extremely effective and had far less impact on the environment than some modern methods.

The SHADUF consortium is coordinated by EJTN in Belgium and composed of teams from Algeria, Egypt, Gaza/West Bank, Greece, Italy, Jordan and Morocco. It looked at examples of water-harvesting from all over the Mediterranean such as the foggara system – thousands of years old, it uses underground tunnels to collect water both efficiently and sustainably.

Other traditional methods studied were aqueducts in Jerusalem, Israel; traditional water management systems in Egypt; and ancient water drainage techniques in Greece. SHADUF evaluated the sustainability of existing water management systems and developed the first-ever database of traditional water management techniques including the ancient water-harvesting systems from Petra in modern-day Jordan. The project's outcome represents a fresh perspective on the possibilities of water management using both ancient and modern techniques.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[47] See http://www.shaduf-eu.org/ online.

ANNEX 8
ETHICS – A NECESSARY UNDERPINNING OF ALL PURSUIT OF KNOWLEDGE AND INTERNATIONAL SCIENTIFIC COOPERATION

NEBRA:
Duration: 03/01/2005 to 02/12/2006,
EU funding: EUR 380 000, FP6

NEBRA ('Networking for Ethics on Biomedical Research in Africa') aimed at fostering networking medical research ethics committees in Africa. This was done by identifying and evaluating criteria necessary for creating a network infrastructure for an advanced systematic documentation, information and communication tool in the field of ethical issues in science and research compiled on the basis of evaluating various scenarios and models.

The European and Developing Countries Clinical Trials Partnership, funded under FP6 and through partner contributions, aims at accelerating the development of interventions into clinical trials tailored to the needs of African countries. Given that high-quality ethics review capacity is a key component of health research, and given the lack of studies on the availability of ethics review capacity in Africa, surveys were carried out in order to identify existing capacity and to clarify needs, before proposing training programmes for African biomedical researchers/ethics committee members. In addition, a North-South and South-South network of ethics committees reviewing trials strengthened and promoted the creation and operation of these structures in host countries. As a first step, trained African students under the guidance of both African and European supervisors identified existing ethics review capacity and needs in several African countries.

The NEBRA countries were Benin, Burkina Faso, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of Congo, Gabon, Gambia, Ghana, Mali, Nigeria, Senegal, and Togo. NEBRA's Steering Committee was assisted during the key steps by the outstanding expertise present among an Advisory Group, which included representatives of the existing African networks. At the end of the project, a group of observers from international public and private institutions interested in ethical aspects of biomedical research in developing countries helped NEBRA in building a sustainable network of ethics committees in Africa.

The NEBRA consortium included four African institutions from Benin, Gabon, Gambia and Mali, as well as two European organisations from Germany and France, and the WHO. It was a project associated with the European & Developing Countries Clinical Trials Partnership EDCTP; more associated results, including follow-up activities, can be obtained from the web site on e-learning promoted by EDCTP.

ANNEX 9
ADDITIONAL RESOURCES / WEBSITES

FURTHER READINGS

Chavance, P., M. Bâ, D. Gascuel, J.M. Vakily et D. Pauly, (eds.) 2004. Pêcheries maritimes, écosystèmes et sociétés en Afrique de l'Ouest. Un demi-siècle de changement. Actes du symposium international, Dakar, Sénégal, 24-28 juin 2002. Rapp. Rech.Halieut.ACP-UE, 15(1):532 p. + annexes. Paris, IRD et Luxembourg, Office des Publications Officielles des Communautés Européennes

Enne, G., D. Peter and D. Pottier, (eds.) 2001. Desertification Convention. Data and information requirements for interdisciplinary research. Luxembourg, Office for Publications of the European Communities, 374 p.

European Commission, 2009a. A strategic European framework for international science and technology cooperation. Communication from the Commission to the Council and the European Parliament. Brussels, European Commission, 16 p.

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Feoli, E., D. Pottier and Z. Woldu (eds.), 2000. Sustainable development of dryland areas of East Africa. Proceedings of the International Workshop, Addis Ababa, 9-12 November 1998. University of Trieste, Italy, EC-DG Science, Research and Development, Addis Ababa University, Ethiopia, 453 p.

Lamaddalena, N., C. Bogliotti, M. Todorovic and A. Scardigno, 2007. Water saving in Mediterranean agriculture and future research needs. WASAMED Project (INCO contract ICA3-CT-2002-10013). Proceedings of the International Conference, 14-17 February 2007, Valenzano, Italy. Options Méditerranénnes, Série B, No. 56, Vols I – III (Bari, Centre International de Hautes Etudes Agronomiques Méditerranéennes)

Laureano, P., 2005. The water atlas. Traditional knowledge to combat desertification. IPOGEA and LAIA und the auspices of UNESCO and Fondation Carlo Leone et Mariena Montandon, 437 p. (first published in 2001)

Makhan, V.S., 2009. Making regional integration work in Africa: A reflection on strategies and institutional requirements. Harare, Zimbabwe, The African Capacity Building Foundation, 48 p. ISBN: 978-1-77937-013-6

Nauen, C.E. (ed.), 2005. Increasing the impact of the EU's international S&T cooperation for the transition towards sustainable development. Luxembourg, Office for Official Publications of the European Communities, 26 p.

Ogbu, O. and P. Mihyo, 2000. African youth on the information highway. Participation and leadership in community development. IDRC, 130 p. e-ISBN 1-55250-259-7

Serageldin, I. et J. Taboroff (éds.), 1994. Culture et développement en Afrique. Actes de la Conférence internationale organisée au siège de la Banque mondiale, Washington, 2-3 avril 1992. Washington, Banque Mondiale, Série Débats – Environnement et Développement Durable, No 1:625 p.

Shackleton, C.M., W.M. Pasquini and A.W. Drescher, 2009. African indigenous vegetables in urban agriculture. Wageningen, CTA and Earthscan, 328 p. ISBN 978 1 84407 715 1

WHO Maximizing Positive Synergies Collaborative Group, 2009. An assessment of interactions between global health initiatives and country health systems. The Lancet, 373:2137-69.

SELECTED WEB RESOURCES

EU-Africa Partnership-Official Website:
http://www.africa-eu-partnership.org

African Union Website:
http://www.africa-union.org

The African Capacity Building Foundation:
http://www.acbf-pact.org/index.asp

European Commission International Scientific Cooperation:
http://ec.europa.eu/research/inco

Past and current S&T cooperation opportunities through European Research Framework programmes:
http://cordis.europa.eu/home_en.html

European Commission Development policy:
http://ec.europa.eu/development

European Commission Neighbourhood policy:
http://ec.europa.eu/world/enp

European Commission Trade policy:
http://ec.europa.eu/trade/

European Commission External Cooperation Programmes: http://ec.europa.eu/europeaid

European Commission Education and Culture External Relations Cooperative Programmes:
http://ec.europa.eu/education/external-relation-programmes/doc1172_en.htm

Technical Centre for Agricultural and Rural Cooperation (CTA) (ACP-EU Cotonou Agreement):
http://www.cta.int – see particularly the Brussels Development Briefings at http://brusselsbriefings.net; the 'Knowledge for Development' portal at http://knowledge.cta.int and the publication and media services at http://cta.esmarthosting.net

Histoire générale de l'Afrique, 1999. UNESCO (collectif de 230 auteurs), en 13 langues, dont trois langues africaines, l'anglais, le français, l'arabe:
http://www.unesco.org/culture/africa/index.html

European Centre for Development Policy Management (ECDPM):
http://www.ecdpm.org

Science and Development Network - SciDevNet:
http://www.scidev.net/en -
http://www.scidev.net/fr

European and Developing Countries Clinical Trials Partnership:
http://www.edctp.org

Forum for Agriculture Research in Africa (FARA):
http://www.fara-africa.org

Conservation et utilisation rationelle des écosystèmes forestiers en Afrique Centrale (ECOFAC):
http://www.ecofac.org/

Sustainable Energy Africa:
http://www.sustainable.org.za

Africa: Atlas of Our Changing Environment:
http://na.unep.net/atlas/AfricaAtlas

UNEP's World Conservation Monitoring Centre on Africa:
http://www.unep-wcmc.org

FishBase for Africa:
http://www.fishbase.org/tools/region/FB4Africa/FB4Africa.html/

Euro-Africa Information and Communication Initiative and Conference:
http://euroafrica-ict.org

European Commission

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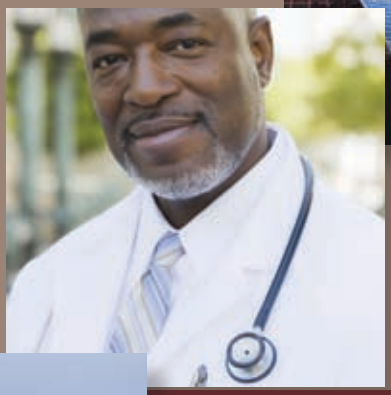

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