Roadmap towards a jointly funded
EU-Africa Research & Innovation Partnership,
with an initial focus on
food and nutrition security and sustainable agriculture.

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<tr>
<td>ACP</td>
<td>Africa, Caribbean and Pacific</td>
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<tr>
<td>AGRA</td>
<td>Alliance for a Green Revolution in Africa</td>
</tr>
<tr>
<td>(DG) AGRI</td>
<td>European Commission – Directorate General Agriculture and Rural Development</td>
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<td>AR</td>
<td>Agricultural Research</td>
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<td>AR4D</td>
<td>Agricultural Research for Development</td>
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<td>ASARECA</td>
<td>Association for strengthening Agricultural Research in Eastern and Central Africa</td>
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<td>AU</td>
<td>African Union</td>
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<tr>
<td>CAADP</td>
<td>Comprehensive Africa Agriculture Development Programme</td>
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<tr>
<td>CAAST-NET Plus</td>
<td>Science, Technology and Innovation cooperation between Sub-Saharan Africa and Europe</td>
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<tr>
<td>CAP</td>
<td>Common Agricultural Policy</td>
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<tr>
<td>CARD</td>
<td>Coalition for African Rice Development</td>
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<tr>
<td>CCARDESA</td>
<td>Centre for Coordination of Agricultural Research and Development for Southern Africa</td>
</tr>
<tr>
<td>CGIAR</td>
<td>(formerly) Consultative Group for International Agricultural Research</td>
</tr>
<tr>
<td>CIDILID</td>
<td>Combating Infectious Diseases in Livestock for International Development</td>
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<tr>
<td>CORAF</td>
<td>Conseil ouest et centre Africain pour la recherche et le développement agricole</td>
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<td>CRP</td>
<td>CGIAR Research Programme</td>
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<td>CSA</td>
<td>Coordination and Support Action</td>
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<tr>
<td>CWG AKIS</td>
<td>Collaborative Working Group on Agricultural Knowledge and Innovation Systems</td>
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<tr>
<td>(DG) DEVCO</td>
<td>European Commission – Directorate General for International Cooperation and Development</td>
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<tr>
<td>EDCTP</td>
<td>European and Developing Countries Clinical Countries Partnership</td>
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<td>EFARD</td>
<td>European Forum for Agricultural Research for Development</td>
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<td>EIARD</td>
<td>European Initiative for Agricultural Research for Development</td>
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<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>PRB</td>
<td>Population Reference Bureau</td>
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<td>PROLINNOVA</td>
<td>Promoting Local Innovation in ecologically oriented agriculture and natural resource management</td>
</tr>
<tr>
<td>(DG) RTD</td>
<td>European Commission – Directorate General Research and Innovation</td>
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<tr>
<td>R&amp;I</td>
<td>Research and Innovation</td>
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<td>RINEA</td>
<td>Research and Innovation Support for EU and Africa</td>
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<td>SAAA</td>
<td>Science Agenda for African Agriculture</td>
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<td>SCAR</td>
<td>Standing Committee for Agricultural Research</td>
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<tr>
<td>SRO</td>
<td>(African) sub-regional organisation</td>
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<td>SSA-CP</td>
<td>Sub-Saharan Africa Challenge Programme</td>
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<td>STI</td>
<td>Science, Technology and Innovation</td>
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<td>STISA 2024</td>
<td>Science, Technology and Innovation Strategy for Africa 2024</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>WAAP</td>
<td>West African Agricultural Productivity Programme</td>
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Executive Summary

Senior officials of the EU-Africa High Level Policy Dialogue (HLPD) on Science, Technology and Innovation agreed to work towards a long term jointly funded and co-owned Research and Innovation Partnership (R&IP) with, as a first priority, the role of science, technology and innovation (STI) in ensuring “Food security, nutrition and sustainable agriculture” (FNSSA). The HLPD tasked an expert working group (EWG) to prepare a roadmap setting out short, medium and long-term milestones.

The call for a roadmap was prompted by the level of global hunger, with 805 million people going hungry, the expanding nutritional imbalances in Europe and in Africa, characterized by persistent under-nutrition and growing diet-related disease, and the challenging target for agriculture to sustainably respond to the demand of a global population predicted to pass over 9 billion by 2050, with the majority of this growth expected to occur in Africa. Further, these challenges must be addressed in the complicating context of climate change, dwindling natural resources, increased energy costs, and other anticipated future trends.

In defining the roadmap cognisance was taken of African and European regional goals for agriculture and food systems. Substantial convergence exists between the main policy objectives of the European Common Agricultural Policy, CAP, and the objectives of the Comprehensive Africa Agriculture Development Programme, CAADP, as well as of the Science, Technology & Innovation Strategy for Africa, STISA-2024. Both the EU and AU share the policy objectives of producing more food with appropriate inputs, enhancing income growth and promoting rural development.

The critical elements of the innovative approach to be implemented by this R&I Partnership are:

- The enhanced coordination of research relevant to FNSSA between African and European researchers and the broader mobilisation of the STI community;
- The Joint design of the R&I Partnership by European and African stakeholders;
- The direct linkage of research and innovation and the inclusion of the complete value chain.

The EWG proposes that this R&I Partnership be organized around selected themes which are central to FNSSA. The EWG has identified, three indicative research themes and a set of cross cutting areas referred to as Institutional Innovation which have the potential to satisfy the approach stated above, namely Sustainable intensification, Agriculture and food systems for nutrition, and Expansion and improvement of agricultural markets and trade.

While these indicative areas have been identified, specific research projects should be jointly identified and designed after consultation with other stakeholders within the framework of this proposed R&I Partnership. The EWG recommends that the following five criteria be used in the selection of research project:

- Relevance of the research to African and European priorities for FNSSA;
- Capacity for joint research, based on principles of equity, and involving comparable and complementary expertise and resources;
- Expected impact of research and likelihood of uptake through an integrated knowledge system with all stakeholders;
- Scalability, or the likelihood that effective research outputs and outcomes will have impact at national or even continental scales;
- Complementarity and value for money, based on the intention that the new investment will also up-scale existing bilateral and multilateral collaboration.
The EWG recommends that the proposed R&I Partnership will be most effective if implemented through a portfolio of mechanisms, tailored to select and incorporate combinations of competitive calls for proposals, commissioned work, and targeted facilitation mechanisms.

In the short term, starting in 2015, the EWG proposes that the R&I Partnerships be implemented using existing instruments that support the goals and aims of this road map. In the long term a specific platform should be developed to support the R&I Partnership. This could take the form of both, Public-Public partnership or Public-Private partnerships. It is recommended that the platform may be initially launched as bi continental Public-Public partnership between the EC, the AUC and, on a voluntary basis, European and African Governments.

The EWG considers that an adapted monitoring, evaluation and impact assessment programme should be an essential part of the roadmap. Monitoring and evaluation of the effectiveness of the mechanisms proposed for the R&I Partnership would be critical to provide the partnership with the ability to evolve and to address the short/mid/long term goals articulated by the HLPD.

**Highlights**

Three characteristics of the proposed Roadmap for a EU-Africa partnership in Research and Innovation on “Food security, nutrition and sustainable agriculture” make it different from related past initiatives.

- **The policy perspective of this roadmap is one of a true Africa- Europe joint and balanced partnership.** It has been developed by a group of 5 European and 5 African experts, working under the guidance of the EU Africa HLPD bureau. Not surprisingly, this roadmap proposes a balanced partnership that is jointly owned, governed and funded by European and African institutions, moving away from an “aid perspective”, where Europe is mainly a funder and Africa mainly a beneficiary, to a joint endeavour with added value for both partners. This implies, for instance, that this partnership calls for the participation, on the European side, of not only AR4D but also AR institutions, harnessing a broader expertise.

- **Within this policy perspective of a balanced partnership, the roadmap proposes an all-encompassing R&I framework, covering all aspects of food security, nutrition and sustainable agriculture.** This framework provides the required perspective to align, under a common vision, all existing (and under development) joint R&I activities, irrespective of their funding mechanisms or legal instruments. This enables the emergence of synergies and the optimisation of investments. It also leads to the identification of gaps, and therefore to the proposition to invest in an ambitious and innovative initiative jointly funded by the national and continental public institutions of Africa and of Europe, with the participation and support from the private sector (including farmers).

- **The proposed framework also enables local actions - adapted to the huge diversity of local contexts both in Africa and in Europe - to be linked with National, regional, continental and bi-continental policies in research, innovation, trade, capacity development, knowledge management....** It proposes, in a process similar to the European Innovation Partnership (EIP), investment in international R&I networks while also connecting them to local multistakeholder research and innovation processes where these diverse actors engage in designing the research agendas, defining priorities and taking risks in innovation. This allows for both the generation of diverse innovation adapted to the multiplicity of local specificities while at the same time generating generic knowledge and know-how which can be exchanged between countries and continents.
1. An innovative initiative: background, rationale and specificities

1. Senior officials of the EU-Africa High Level Policy Dialogue (HLPD) on Science, Technology and Innovation agreed to work towards a long term jointly funded and co-owned Research and Innovation Partnership with, as a first priority, the role of science, technology and innovation (STI) in ensuring “Food security, nutrition and sustainable agriculture”\(^1\). An integrated STI approach is taken, recognising the important cross-cutting nature of innovation, entrepreneurship, research infrastructures and technical competence strengthening. As a consequence, the HLPD tasked an expert working group to prepare an input to a roadmap setting out short, medium and long-term-milestones in terms of the goals above\(^2\).

The EWG, made up of 10 experts from Europe and from Africa, worked together from April 2014 to April 2015 through face-to-face meetings (in Brussels, Addis Ababa and London) and virtual meetings. They had regular opportunities to exchange views with the members of the EU-Africa HLPD bureau on previous drafts of the present proposal.

In February and March 2015, an advanced draft of the roadmap was also submitted to a targeted consultation of stakeholders in Europe and in Africa. Comments from over 50 respondents - representing governments; international organisations; public funders and development agencies; local authorities; research institutions, universities and scientific networks; NGOs and civil society organisations; private sector (banks, food industries, farmers)… - provided valuable inputs and confirmed the relevance of the proposal.

2. The rationale for Africa and EU to develop an innovative R&I Partnership is as follows:

At present the level of global hunger continues to be a challenge, with 805 million people going hungry (global hunger index 2014), and the prevalence of undernourishment in Africa is the highest ever with 226 million people, or 21.2% (FAO food security indicators 2013).

It is also projected that the global population will increase from 7 billion to more than 9 billion by 2050. The majority of this growth is expected to occur in Africa, from around 1 billion to 2.1 billion by 2050 (www.unfpa.org) or from 1.1 billion “today” to “at least” 2.4 billion by 2050 (2013 World Population Data Sheet, produced by the Population Reference Bureau PRB). (The increase in population and the change of food habits imply that world food production needs to increase by 60 to 100 % \(^3\) see for instance http://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF2050_Global_Agriculture.pdf ; http://www.census.gov/population/international/; http://esa.un.org/unpp/; http://www.un.org/popin/) by 2050, 5 to 7 fold more in Africa. The required increase will further threaten natural resources, particularly water and soil. Hence there is a need to harness science, technology and innovation to bridge the gap in a sustainable way.

Increasing the quantity of food produced will not be a sufficient answer in itself as food security\(^4\) is an issue not only of food “availability” but also of “access to food”, affordability, stability

\(^1\) Including the management of water resources for agriculture.
\(^2\) See Terms of Reference in Annex 1
\(^3\) Food security has been defined in the World Food Summit Declaration, Rome, 1996, as a “situation in which all people at all times have physical and economic access to enough safe and nutritious food in order to cover their dietary needs and food preferences for an active and healthy life. Food security is a multidisciplinary concept which includes economic, political, demographic, social, cultural and technical aspects. This concept is set up on four pillars:

- The physical availability of food for everyone.
- Economic and physical access to food involving such as stable markets, affordable prices, decent incomes,
of food supply and the quality of that supply, beyond its basic calorific value. In many African countries and other low income regions, under-nutrition and stunting, the result of a shortage of nutrients in pregnancy and early life, persist. Large parts of the African population also suffer from micronutrient deficiencies.

European food systems today generally provide, through locally produced and imported food, sufficient nutrients for Europe’s population, but both in Europe and in Africa, obesity and diet-related non-communicable diseases pose a growing health burden in both urban and rural communities. As a consequence, this challenge of achieving food and nutrition security within a context of sustainable agriculture, globally but also in Africa and in Europe, calls for increased investment and collaboration in agricultural development, including agricultural research. Several agricultural programmes dedicated to research and innovation have been launched or expanded with increased funding in very recent years following a relatively long-period of disinvestment.4

In spite of those increased investments, Food and Nutrition Security and Sustainable Agriculture continue to be seen as a challenging target, particularly in light of the complicating factors of climate change, dwindling natural resources, increased energy costs, and other anticipated future trends. There are many obstacles perceived to hamper progress in this area, in particular lack of coordination between initiatives, and insufficient mobilization of knowledge (both new and traditional) to sustain the innovation process5.

The fragmentation of efforts urgently needs to be reversed. Issues of food and nutrition security and sustainable agriculture must not be seen as separate development problems for the South and agro-environmental problems for the North. These are shared problems in a world increasingly serviced by a global food supply and integrated food systems. Useful innovation can arise in both African and European contexts, and its rapid sharing, adaptation and implementation is a clear win-win for both regions.

The opportunity therefore exists to launch a new initiative between Europe and Africa in this field, adding value to current investments. This is the common endeavour that the EU and Africa have chosen.

3. Although in the context of Science, Technology and Innovation (STI) for agriculture and nutrition, most African and European countries are in quite different situations, substantial convergence exists between their regional goals for agricultural and food systems. The main objectives of the European Common Agricultural Policy, CAP, meet the objectives of the Comprehensive Africa Agriculture Development Programme, CAADP. Another convergence is that in Europe as well as in Africa, agriculture is dominated by family farms, leading to an emphasis for both continents on farmers’ income and on rural development indicators (in particular, jobs).


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5 In this document, innovation is defined as a “process in which knowledge, from diverse sources, is mobilized and combined to generate societal, economic and environmental impact”.

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which is focussed on, amongst others, the use of Science, Technology and Innovation to the Eradication of Hunger and Achieving Food Security.

To summarize, both the EU and AU share the policy objectives of:

- Producing more, with the appropriate use of inputs,
- Enhancing income growth, and
- Promoting rural development.

Their capacity to meet the above objectives depends very much on scientific progress, its adequacy to local biotic and abiotic conditions, on institutional set-ups to promote innovations and up-scaling, on research and innovation capacities (infrastructure, HR, funding, etc).

4. It is on the basis of these shared challenges and opportunities in agriculture and food and nutrition security, that the EU-Africa Summit 2014 and the EU-Africa HLPD have agreed to launch a “Research and Innovation Partnership” of joint research and innovation collaboration, managed and supported by EU and AU institutions, and potential other contributors/funders.

This jointly designed and funded R&I Partnership in research and innovation will accelerate the development, sharing and implementation of scientific approaches to improve food and nutrition security and the sustainability of agricultural systems in Africa, Europe and worldwide. These scientific advances, when implemented in national agricultural systems, will contribute to:

- The development of better and healthy diets for billions of people.
- The improvement of food security in both regions
- The creation of jobs and new opportunities for smallholder farmers on both continents
- The increase of diversification of agricultural systems and agribusinesses
- The reduction of the yield gap in food production
- The opening of new markets and the development of better trade within and between both continents- the reduction of structural dependence of African countries to food aid

5. This R&I Partnership will build on recent bilateral and multilateral AR and AR4D projects and efforts in research and innovation capacity building.

It could provide a framework for improved coordination of the diversity of European- and African-supported research projects and programmes on agriculture and food and nutrition security.

It could promote multidisciplinary collaborative research and innovation activities between EU and AU, in which African and European scientists will jointly design and execute, together with the other stakeholders, a research and innovation agenda, to which both will contribute scientific expertise and resources.

6. To facilitate optimal returns from investments in agricultural and food research, the R&I Partnership will also address critical policy and market framework conditions for sustainable agricultural growth and food security in Africa and Europe.

7. The critical elements of the innovative approach to be implemented by this R&I Partnership are:

a. The enhanced coordination of research relevant to food and nutrition security and sustainable agriculture between African and European researchers and the broader
mobilisation of the STI community in Europe and Africa (going beyond the European AR4D institutions);

b. The Joint design of the R&I Partnership by European and African stakeholders;

c. The direct linkage of research and innovation.

8. This R&I Partnership will also involve the private sector (including farmers)

Continuous interaction between researchers, policy makers and the private sector, including farmers, is needed to achieve innovation and have them adopted. The engagement of the private sector from both continents is therefore sought in supporting this R&I Partnership, aiming at translating research knowledge into tangible products, systems or mechanisms that can be adopted by the society, ultimately resulting in promotion of socioeconomic development.

The private sector is not homogeneous and covers a very diverse universe, from smallholder farmers to multinational agribusiness, therefore a framework addressing the diversity of partnerships and classifying them according to their role/benefit in the partnership will be developed and included in the criteria for evaluating the proposals. The particular heterogeneity of the private companies established in Europe and Africa should be looked at as another level of the R&I Partnership and their equitable inclusion in the R&I Partnership should be based on mutual interest, benefit, and capacity for innovation in their target countries.

Among the today’s factors hindering the uptake of research outputs are lack of linkages among stakeholders, lack of organization of the private sector (including producers), lack of private sector engagement, inadequacy of R&D outputs with private sector’s priorities, and lack of information from the R&D sector. The way to engage the private sector and its corporate decision makers is to involve it in the research agendas from the beginning, in global, regional and national identification of research needs, in funding and investing and in making part of the research teams bringing complementary expertise. This can be foreseen through multilateral dialogue to define priorities and challenges and to build trust between all stakeholders (move from priority takers to priority makers) and include the commitment that success pilot projects will have support to be scaled up and implemented, and by providing clear awareness of trade-offs with intellectual property protection issues.

This R&I Partnership will have a focus on innovation. Innovation is pursuit by the private sector if considered to deliver competitive advantages and as an opportunity for profit. Despite its potential in driving innovation and expertise in management and efficiency, analyses of the determinants of private sector investment are incipient. Currently, private companies make a contribution to the food and nutrition arena mainly in providing innovation in seeds, pesticides, fertilizers, machinery and livestock. The focus on innovation should be advertised in order to trigger the interest of the private sector that will look at this R&I Partnership as a distinctive mechanism, easier to participate in and delivering better results.

Private companies usually do not seek proactively to be involved in public partnerships for research and innovation but they are often requested from academia to support research projects. Its participation is mainly through providing funds and in-kind support through non-remunerated work, equipment, and resource materials. Many of the existing mechanisms of cooperation and instruments impose limiting controls that hamper the participation of the private sector in research and innovation programs. Highlighted are the extensive administrative procedures required to apply to the calls, costs in time and resources to develop concept notes and grant proposals and assembling the required documentation, complex regulations required to register and release new
products, conflicting intellectual property right policies between privates and the academia, poor tax incentives to reward companies who invest in research.

There are a number of barriers to obtaining private-sector financing, which are mostly related with risk, low technical capacity levels or lack of information. This R&I Partnership can advocate its uniqueness if the role asked to the private sector, supported by its participation in project design and research agendas, is not only to finance the research, but mainly as innovation-facilitators, helping filling gaps from research outputs to use by the society in holistic views of value chains. Another novel feature of this R&I Partnership should include the private sector among the beneficiaries for capacity building (both human and institutional).

To change behaviours and attitudes, this R&I Partnership must provide the private sector with new tools to allow their participation in research and innovation in win-win models, bridging the public-private sector divide for linking research and innovation. The private sector seeks for business cases and research funding opportunities, which rarely allow participation on its specific profit-making terms.

Putting the particular skills of the private sector to its best use can be achieved by innovative financing in public-private partnerships. Examples include looking at the private sector on the basis of their intellectual property and other forms of know-how and intangible assets rather than physical and financial assets; leveraging investments by taking or sharing the investment risks (e.g. Africa Agricultural and Trade Investment Fund (AATIF)) or Advanced Market Commitments (AMC) ensuring a bottom market and thereby reducing the risk of market failures; partnerships catalysing private investment and mechanisms to whole value chains (like integrating supply from small local producers in food related corporate business) and mechanisms for de-risking non-profitable engagement. Mechanisms aiming at removing barriers between actors in the value chains are to be foreseen. In addition, a favourable political will and regulatory environment is needed to create a business-friendly environment and to encourage private sector investment, including allowing for failure. Providing the interested companies with a good understanding of other initiatives that target the same segment of the private sector, including private-sector liaison with sectorial ministries, is also desirable to build trust.

Moreover, strong and aggressive communication abilities are needed to get the attention of the private sector, namely using business language and to-business issues, keep realistic expectations, identify with transparency co-benefits for companies, advocate access to new markets, brand recognition and financial incentives to scale up the innovations.

Innovative examples of public-private, EU-Africa multi-stakeholder platforms for research and innovation exist and are among some of the best and current models for achieving best results in agricultural research for development, allowing for replication. Known research-private sector partnerships have been mostly established in the Health sector and have been dominated by international companies through Corporate Social Responsibility programs (e.g. Unilever) and alongside other focused public-public funding mechanisms including the EDCTP for clinical trials.

Regarding food and agriculture issues, Public-Private models were implemented, both within Africa such as the CORAF and FARA Innovation Platforms, the PAEPARD project, the Global Alliance for Improved Nutrition, the G8 initiative (GAFSN), FINNOVAR,...or within Europe such as the SMEs participation to FP7 and H2020 projects, the PPP on Bio-Based Industries, the European Innovation Partnership for sustainable Agriculture, the UK Research Clubs.
Impact analyses of these initiatives will help designing mechanisms of participation built on lessons learned, selecting specific modules of success from each programme, on governance, financing and benefits, to be individually incorporated in the present programme, collecting the “best from each past experience” to tailor an attractive way to engage the private sector.

Likewise, it is important to view the role of farmers especially smallholders in a different manner. They are not purely the receiver of research products, but need to be actively involved in the entire research and innovation process in order to achieve a higher likelihood of adoption and ultimately of impact. Many of the efforts to transform scientific knowledge into sustainable agriculture and natural resource management (NRM) have brought only limited benefits to smallholder farmers, including fishers, livestock-keepers and other resource users. A few pioneering research institutions and programmes have recently started to engage more directly with smallholders and supporting organisations in the field. These institutions are also open to learn from examples of ARD driven and co-managed by smallholders and facilitated by civil society organizations (CSOs) outside of the formal ARD sector, in what could be called “informal” ARD.

Hence, there is scope to explore new ways of doing “business” by rearranging the roles and responsibilities of the various actors.

9. For such R&I Partnership, there is a need to (1) identify areas of common research priority (in biological, environmental and social sciences), and (2) to devise a mechanism for collaboration on these that creates a truly equitable Research and Innovation Partnership. Both of these components, the “what” (see chapter 2) and the “how” (see chapter 3), will be critical to success, and are described below.

2. Proposed priorities for shared research and innovations activities

We propose that this R&I Partnership is organized around several themes which are central to sustainable agriculture and food and nutrition security and which will allow facing the impact of climate change, for both the EU and AU. Under this proposal, “agricultural research” is used in a broad sense, including research on crops, livestock and fisheries (especially aquaculture), and including research in biological sciences, natural and social economic sciences.

These themes should be prioritized on the basis of a set of criteria that draw out the most important shared research and innovation interests and needs with the greatest possibility of equitable collaboration and uptake at national and regional levels in both Europe and Africa.

Within each of these research themes, specific European and African research needs may vary, but the scientific agenda to be developed will focus on areas where joint efforts will have greatest benefit.

Five criteria to set priorities are proposed:

1. Relevance of the research domain to African and European priorities for sustainable agriculture and food and nutritional security, based on a consideration of existing EU and AU planning at the regional and national level (e.g. CAP “objectives”, CAADP “core results”).

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6 Such evaluation of on-going experiences are essential to the learning process, including when they highlight some difficulties in public private collaborations. See for instance the report published in September 2014 « La Faim, un business comme un autre. Comment la Nouvelle Alliance du G8 menace la sécurité alimentaire en Afrique » http://www.oxfamfrance.org/communique-presse/agricultures-paysannes-et-investissements-agricoles/faim-business-comme-autre
2. Expected impact of research and likelihood of uptake, based on a clearly delineated “impact pathway” by which research and innovation will form part of an integrated knowledge system with farmers including smallholders, advisors and other stakeholders. This will contribute to solutions and evidence for policy change, to positive agricultural and nutritional outcomes and to significant improvements in economies, wellbeing and resilience.

3. Capacity for joint research, based on comparable and complementary scientific expertise and resources in both the African and the Europeans scientific communities.

4. Scalability, or the likelihood that effective research outputs and outcomes will have impact at national or even regional scales.

5. Complementarity and value for money, based on the intention that the new investment will also up-scale existing bilateral and multilateral collaboration that will aim at filling research gaps or act synergistically with current investments in similar areas.

This R&I Partnership will provide short- to mid-term solutions, in the form of tools, knowledge and understanding, through the use of both new cutting edge technologies as well as indigenous and culturally sensitive knowledge, which can be used in applied research to solve problems in specific and different agro-ecological contexts in Africa and Europe.

Africa and Europe also have a strong common interest in building the capacities in basic science of direct and indirect relevance for agriculture, food and nutrition security. This is especially so for achieving long-term mutual objectives of sustainable natural resource use (biodiversity, water, soils and biomass) in a context of increased risks and uncertainties, including climate change. Enhanced, science-based risk-response capabilities are a cross-cutting issue in the proposed R&I Partnership components.

The Expert Working Group has identified, after consultation with AU and EU authorities, three indicative research themes which have the potential to satisfy the criteria stated above. For each theme, the following elements are briefly mentioned (and may require further analysis):

- The shared challenge/opportunity and the need for scientific research,
- The short, medium and longer term activities which the R&I Partnership should undertake,
- The expected outputs and outcomes of new research, including its added value,
- The investments required, including partnerships with existing relevant activities.

Specific research projects are not presented here as these must be jointly identified and designed by collaborating African and European scientists together with other stakeholders in the framework of this proposed R&I Partnership. Rather, the choice is to outline the broad research thematic areas where projects may be developed.

2.1 Sustainable Intensification

Europe and Africa share, with other regions, the global challenge to produce more food for a growing population while reducing the environmental impact of agriculture and its demand for ecosystem services. Both continents face challenges associated with the high cost of inputs, environmental degradation and pollution, local water scarcity and changing climates. European
countries and other large players on international agro-food markets greatly influence global food supply, with impacts for farmers and consumers in Africa. European and African governments have made commitments to support global food and nutrition security. Looking to the future, Africa, with an estimated 65% of the uncultivated agricultural land remaining in the world and a potential to expand irrigated land by 100 million hectares\textsuperscript{7}, will become a key global producer, and international investment in African agricultural systems is already growing rapidly.

On the other hand, global fish production continues to outpace world population growth, and aquaculture remains one of the fastest-growing food producing sectors. In Africa, fisheries and aquaculture stand as 1.26\% of total GDP, reaching 6 \% of gross value added of agricultural contribution, and employing directly and indirectly over 12 million people\textsuperscript{7} (The Value of African Fisheries, NPCA/FAO Fisheries Project, 2014). Food from capture fisheries is not an extensively growing activity, demanding for innovation on processes optimization. Conversely, aquaculture keeps growing, both in Europe and Africa (State of World Fisheries and Aquaculture, 2014; FAO). An important market demand for fish exists, with potential to absorb significant growth in both sectors. Under this scenario, research and innovation in costal fisheries is required to assure environmental and economical sustainability in the context of increased demand and climate changes which will unbalance marine ecosystems. Also, aquaculture can be climate-smart and have low environmental impact when best practices are used. Attitudes toward aquaculture have been adopted by several stakeholders, including the private sector, as growth has been driven by path-finder investors and entrepreneurs. Aquaculture is recognized in the “Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa”, ratified in Addis Ababa in May 2014 by the Ministers of Agriculture.

Thus, while demographic trends that will demand greater food production are concentrated in the global South, both Africa and Europe will want to improve the sustainability of their production to meet future global demand. The great challenge in the Mediterranean Basin and in Sub-Saharan-Africa is developing sustainable market-driven food production systems that can boost household economies without water resources degradation and pollution.

The productivity (relative to the production of food/fibre/biomass and of services) of African agriculture could be greatly increased in the next decade by improved access of farmers to knowledge. This could include better pest management practices, mechanization, seeds quality, efficient water use and better nutrient management, and improved services, incl. information technology-based ones. Many European farmers already benefit from appropriate access to these inputs and services, and are much closer to their productive potential than most African farmers, who have currently very limited access to inputs and technologies and adopt a low risk approach to cultivation.

Both regions – while at different stages in historical trajectories - are confronted with agricultural and rural transformations in terms of family farms’ structural changes, issues of attractiveness of farming for youth, farm size and land and labour market changes, emerging organizational and contractual linkages to processing and retailing, all of which entail far reaching social change. Socio-economic research needs to provide guidance to all the involved public and private decision makers to steer these transformations in coherent and socially acceptable ways.

Transforming value chains are part of the innovation process in the social and economic change processes, and both regions have to cope with the rising costs and complexities of inputs, to solve greater problems with their farm management in the context of climate change mitigation and adaptation and to face the growing consequences of poor use of natural resources, in the form of agri-environmental degradation (soil and water) impacting on productivity. Beyond their differences, both continents need to consider how to promote a “knowledge based” intensification, including sharing of local knowledge. Europe and Africa’s different trajectories of agriculture input uses must therefore ultimately converge on a sustainable level of affordable and productive inputs of increased knowledge contents, adjusted to differing agro-ecologies and vertical coordination through governance.

Both Europe and Africa are challenged to produce food in a sustainable manner. They therefore share a common interest in research on sustainable intensification. Research is needed to both improve the production of food/fibre/biomass and of services (social, economic and environmental) and to reduce the environmental impact and the depletion of natural resources. Areas of research opportunity and focus should include:

- Ecological intensification approaches such as conservation agriculture, intercropping, organic agriculture, eco-intensification and crop-livestock integration, which optimise the use of ecosystem services to produce food at lowest costs and environmental impact.
- The identification, and breeding, of animals and crops to maintain/increase productivity and resilience under conditions of limited external inputs of water and fertilizers, soil and land management practices, and (in the context of climate change) increased abiotic and biotic stresses, making use of a range of approaches.
- Research on animal and crop health, including fish, will be given due attention at all relevant scales (from farm to international levels) with the objectives to develop sustainable approaches optimising resource efficiency, minimising production losses and avoiding geographical spreading of diseases/pathogens.
- Research on appropriate use of soil, water, land and inputs management practices, including improved mechanization, integrated pest management, precision agriculture and good irrigation practices, with the aim to deliver greatest benefits at lowest costs and environmental impact.
- Research on advanced informed marine spatial planning and functioning of marine ecosystems, and aquaculture technologies and systems that are environmental and economically sustainable, towards increased production and competitiveness with minimal cumulative or synergistic effects on the ecosystem functioning and reduced environmental footprint (also in the context of climate changes).
- Research on organizational innovations, which will facilitate uptake of innovations across farms and rural communities, through new business models and farmer information systems for input and output markets, insurance, land use and land availability, etc. These models and systems have to learn from current and past experiences.

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8 Definition of “Sustainable Intensification”: to produce more outputs (not limited to agricultural products) with a more efficient use of all inputs (not only improved seeds and fertilizers but also knowledge and know-how) on a durable basis, while building resilience and the social and natural capitals, reducing environmental damage and improving the flow of environmental services.
2.2 Agriculture and food systems for nutrition

While agriculture is the basis for food production, and therefore contributes substantially to nutrition, there is a broad international consensus about the enormous scope for research into agriculture and food systems in order to improve diets that generate positive nutritional outcomes.

Dietary inadequacy takes very different forms but these are all linked to limitations in the production, availability, access, affordability and consumption of highly nutritious foods and to social behaviour.

In Africa and other low and middle income regions, under-nutrition - the lack of sufficient nutrients for healthy development - persists at unacceptable levels and contributes to child mortality, poor growth and impaired cognitive development and increased risks of disease through the life course. The European Union (including Member States) has committed Euro 3.42bn to tackling under-nutrition through nutrition-sensitive agricultural interventions by 2020 (SWD (2014)234), mostly in Africa, and reducing by 2025 the number of stunted children by 7m (COM 2013)141).

At the same time, many communities in both the North and South have diets high in cheap, energy dense foods such as refined carbohydrates and fats which contribute to overweight, obesity and non-communicable diseases (NCD) including cardiovascular disease, diabetes and some cancers. This problem is growing most rapidly in low and middle income countries, creating a double burden of food-related diseases which reaches beyond urban centres into poor rural households. Both under-nutrition and obesity are associated with micronutrient deficiency, which affects two billion people worldwide whose food intake is low in minerals and vitamins.

Micronutrient deficiency can be addressed through greater inclusion of vegetables, pulses, fruits, bio-fortified staple crops and animal products in diets. Animal products include milk and meat, as well as fish, a particular source of micronutrients and beneficial fatty acids. Fish is an extremely nutritious vital source of protein and essential nutrients and an important part of the diet in Europe and Africa, with particular relevance for many vulnerable populations of the global community. In most SAA countries, but also in some costal European countries like Lithuania, Norway and Portugal, the contribution of fish to animal protein supply exceeds 20% (State of World Fisheries and Aquaculture, 2014). The impact and impact pathways of the fish consumption on nutrition status, livelihoods and development need to be better understood. Research on improving agriculture for nutrition in both Africa and Europe will therefore place particular emphasis on increasing the availability, accessibility and affordability of these foods through improving sustainable production systems for nutritious crops, livestock and marine and freshwater fish.

While the average diets of Europeans and Africans are currently very different, and levels of under-nutrition in Europe are far below those in Africa, both continents share a common food future characterized by growing micronutrient deficiency and diet-related NCDs, if agriculture and food systems are not changed. Globalization is fostering some convergence of African and European food systems, creating shared challenges and opportunities.

A common African and European research agenda on agriculture and food systems for improved nutrition would include the following components:

- Research on improved food value chains so as to deliver more nutritionally rich food to consumers with minimal loss of nutritional value, little wastage and a high level of safety.
• Research to improve the nutritional value of crops and animal products, through advances in breeding and biotechnological innovation, such as biofortification (improved mineral and vitamin levels in various highly productive crop lines).

• Understanding consumer behaviour with respect to healthy diets and nutrition and how education and incentive systems, including regulation, subsidies and taxes, can improve nutrition.

• Public-private partnerships on research to improve the nutritional quality of foods, particularly processed foods in the marketplace.

Underpinning these applied research activities is a need to better understand the physiological basis of nutrition, its relation to diets, the microbiome, age and general health and the influence of genotype and personal history on individual nutritional profiles. While the conditions between African and European consumers differ substantially, there is considerable advantage to developing a common methodology for such research which is robust in different communities and contexts.

There is a common objective to design a collaborative approach to these problems that will accelerate research findings in this area and will contribute to the creation of nutrition-sensitive agriculture and food systems in both continents.

2.3 Expansion and improvement of agricultural markets and trade

Agriculture remains a principal mean of economic growth for many African countries and markets and trade play an important role in future growth at domestic, regional and international levels. Europe represents a major growth market for African agriculture while the demand of Africa’s growing middle class provides a growing market for European agricultural and food products. Enhanced bi-continental and intra-continental (local, national, regional) trade (for instance trade within West Africa) will have benefits for farmers, consumers, and governments of both continents. Non-tariff barriers to trade relate largely to food quality and safety for which research is critical to understand differences of perception about quality attributes, to allow evidence-based decisions and to develop relevant approaches and technologies. The experience of developing trade within Europe may provide useful lessons for intra-African trade, which is a priority area under the Malabo Declaration (2014). While African-European agricultural trade is currently highly asymmetric this will probably change in the future, once African agricultural growth is further enhanced. This should not be seen as conventional support to development projects, as the benefits of common technologies and standards will be greater trade which will benefit both Africa and Europe.

A common strategic African and European research agenda in this field would include the following elements:

• Research into the most effective models and methodologies for the development of surveillance, monitoring and diagnostic systems for sanitary, phytosanitary and other food safety purposes. The development of standards adapted to biophysical and socioeconomic contexts that will permit improved trade in agricultural commodities is dependent on a shared set of methodologies for detection, monitoring and assessing risks (including food safety issues) and opportunities. Lack of harmonisation of requirements for imports and exports among countries currently constitute a major impediment to regional and international trade. There is a potentially considerable added value to these methodologies being developed in a collaborative manner, so that they may be applied broadly, effectively and economically.
• Development of the science agenda of mutually beneficial bioeconomy innovations. Both Africa and Europe use biomass extensively for food, feed and non-food purposes (energy, construction, new bio-chemical and industrial materials, etc.) and the latter can impacts on food markets. In Africa, bioeconomy strategies have been developed in South Africa and Ethiopia. In Europe, the EU has pioneered related science based strategies. Example of specific scientific issues are the expansion of tradable biomass products with due consideration for food security, and research into the opportunities for agricultural value chains innovations and employment.

• Research on reducing excessive fluctuations in food and input prices and improving resilience of food systems. This will enable the design of price observatory mechanisms that are able to predict upcoming price peaks. Europe and Africa have a strong common interest in international and national food markets that are free from excessive volatilities. Such volatility hinders sustainable intensification and hurts especially poor consumers and farmers. Economic research on agricultural and food markets and institutional arrangements (such as stock holding) and infrastructures and information systems aimed at reducing volatility and improving resilience to price changes and shocks in agricultural inputs and products will benefit both African and European consumers and agribusinesses.

• Global Value chains and market power. Research priorities could include: the development of mechanisms for linking smallholder farmers to markets, addressing the question of how to link rural communities to markets, providing them with access to credits and investments and helping them to add value to food value chains; understanding better the impact of urbanisation on trade and rural-urban linkages, and how this will affect the future of farming in Africa and Europe; building on the success of quality labelling schemes - taking note of the outcomes of the African workshops on quality labels and requirements of the food and processing chain - by solving related barriers; new approaches to food safety, like the reduction of aflatoxin content in food and feed crops.

Further prioritisation and identification of research topics will be necessary, for the three research areas previously described. To achieve this, it is proposed that the first action of the Roadmap should be to support an efficient dialogue between the concerned communities of practice (researchers, farmers including smallholders, development actors, actors of the food supply chain, society at large) in both continents, Africa and Europe.

This dialogue should focus on establishing an inventory of existing research, technologies and innovations, drawing on existing mapping studies (so call “meta-mapping”). From this can be drawn a better understanding of levels of adoption (and obstacles to adoption) and impact, evaluating the potential for scaling up in different European and African contexts.

Each of the proposed research topics in the three areas above can be examined in this manner, to identify gaps, priorities and complementarity to existing work.

2.4. Cross cutting issues

Though supporting R&I activities (initially on the three areas identified previously) is a necessary component of the proposed Partnership, it will also be necessary to invest in three cross cutting areas:
1. Creating a framework for improved coordination and added value between the diversity of European- and African-supported research projects on agriculture and food security.

Many projects, funded by a diversity of bilateral and multilateral donors, are currently implementing R&I activities in Europe and in Africa on issues related to food and nutrition security and sustainable agriculture. What is new about the proposed R&I Partnership is the attempt to establish a mechanism to account for these previously existing projects. This would be a way to avoid duplication, increase linkage between existing initiatives and facilitate adoption of results. This mechanism would apply not only to research projects, but also to R&I infrastructures and capacity strengthening initiatives.

To enable this EU-Africa R&I Partnership to reinforce existing initiatives and to facilitate the identification of “gaps” and areas of investments having synergistic effects with other existing initiatives (incl. CGIAR, African research organizations, EU projects and programmes such as JOLISAA, INSARD, PAEPARD and others), the R&I Partnership will need to establish a “clearing house” (for gathering information on what exists – through a database/portal mechanism) and a “sorting house” mechanism, assessing the relevance of proposed interventions on the basis of a set of criteria specific to the EU-Africa R&I Partnership (“sorted” proposal would then be submitted for potential funders, respecting their own funding decision criteria).

2. Supporting innovation processes through adequate mechanisms and capacities, allowing knowledge to be mobilized to generate impact

One specificity of the proposed R&I Partnership is the constant mindfulness to ensure the integration of efficient innovation processes.

Innovation has been at the centre of many STI initiatives in Europe and in Africa and valuable lessons have been learned through these initiatives, and summarized in policy briefs (see for instance the policy brief produced by the JOLISAA project) or in expert reports (see for instance the report published in March 2012 by the Standing Committee on Agricultural Research, SCAR, Collaborative Working Group on Agricultural Knowledge and Innovation Systems, CWG AKIS). Other models require examination in order to determine their potential and identify valuable lessons (e.g. European Innovation Partnership (EIP) , AGRA innovation platforms, CGIAR “capacity to innovate” etc...).

The R&I Partnership will aim at translating research outputs into tangible outcomes. Such a result-oriented approach requires the combination of multiple scientific
disciplines, and of all relevant stakeholders. Hence, the R&I Partnership will focus on Multi-Stakeholder Innovation proposals, in which research projects (including research conducted within development project) and investments in research infrastructures are considered as components of an innovation process.

The strategy for enabling an environment to facilitate innovation and impact will include linkage to farmers’ organizations, markets, social innovation, regional/local ownership, reduction of risk-taking for innovators. The R&I Partnerships must be flexible, allowing for contingency plans to cope with possible unexpected results and adjusting to new approaches to reach the main result-oriented outcomes. Understanding the expected benefits but also how to cope with the risks will be especially relevant to engage with the private sector. Working on whole value-chains (or “value-web”), with a holistic approach, can also be a way to achieve a multi-stakeholder partnership supporting the innovation process and guaranteeing that outputs generate outcomes and impact.

Activities to be promoted in this cross-cutting area will include

1. Establishing or extending/adapting existing multistakeholder dialogue mechanisms (like the EIP focus group or the Innovation Platforms promoted in Africa by FARA, AGRA and others)
2. Adequate information flows (use of ICT)
3. Developing specific funding streams for innovators (taking care of financial risks)
4. Training Innovation brokers
5. Improving the legal framework for the protection of Intellectual property rights, in particular to facilitate collaboration with the private sector
6. Research on social and cultural contexts of production systems and their impacts on FNSSA
7. Conducting research on innovation process.

Activity (6) recognises the need to also consider innovation as a research issue in itself. It is, for instance, widely acknowledged that it is crucial to ensure the involvement of the various categories of stakeholders (including the private sector, farmers’ organizations and smallholder farmers) in all stages of the research process. Yet many questions remain: How to ensure this involvement in practical terms? How to engage stakeholders and through which communication channel and which representation mechanism? How to ensure their commitment to a sometimes long and tedious research process? How to cope with a very diverse and competitive private sector? How are innovation processes initiated and what is the role of social capital? These questions are also current subjects of research.

Additionally the gender dimension should be applied to: a) defining the priorities and tasks (are there any hidden aspects involving gender roles in the objectives? do the tasks involve individuals or populations as the research subject?); b) selecting the methods to be used (do the methods involve human beings or populations? is the number of women and men in the sample balanced?); and, c) defining the expected results (could different
impacts on women and men be expected? could the conclusions and outcomes be better utilized in real life provided gender dimension is considered?)

It is therefore proposed that the innovation activities conducted within the three thematic areas mentioned previously will also be used to generate a generic understanding of innovation processes, a knowledge which could be applied beyond the three areas. Part of this work may also include the analysis of cases where knowledge has been created, but has not been adopted at a large scale (e.g. Conservation Agriculture in many parts of both continents). Activities will cover the emergence of innovations and their effects in various contexts, through specific analyses, combining comprehensive approaches, diagnoses, modelling, and design of tools for use by players involved in innovation. Activities will range from observation to action-participatory research, combining process analyses and support of players at three levels:

1. Farm-level: to assess, understand and support change processes;
2. Agri-food systems level: to determine the relations between production, trade and processing and food consumption;
3. Territorial (including rural-urban) level: to observe and analyse the innovation processes at stake between actors, within a territory or between different territories, in particular between rural and urban areas.

Outputs of such research will enlighten decision-making by public and private players, by generating knowledge of innovation and development processes in agricultural, agrifood and rural systems.

3. Strengthening the capacities for collaboration among the African and European R&I communities.

This area of activity will cover all levels of capacity development - human, organisational, institutional, financial and infrastructural. It should target R&I capacities in Africa (embracing national agricultural research institutes, universities and private sector research), where needs are greater, but also in Europe as a large part of the European R&I community is not currently collaborating with African stakeholders. This is due to various factors - ignorance of opportunities, absence of incentives in career evaluation, etc - to be properly identified and addressed. This will enable the engagement of a broader European scientific community into collaborations with the African scientific community, and the creation of strong professional and human ties linking researchers and innovators between the two continents.

Activities to be promoted in this cross-cutting area will include

1. Development of Human Resources
2. Addressing gender issues
3. Creation and improvement of Infrastructure
4. Facilitating functional networks (between scientists; with stakeholders)
5. Investing in Information and Communication Technology (ICT)
6. Establishing or extending Partnership Platforms between Europe and Africa, with a common goal, a common agenda, joint resources and joint governance.

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14 CEC-WYS (2005). Why gendered science matters - How to include gender dimension into research projects Central European Centre for Women and Youth in Science. pp 44
15 This should include the efficient use of energy
4. Understanding the social and cultural contexts of the production systems impacting FNSSA

Research into the nature of local economic and social and cultural systems, farmers diversity and characteristics, land tenure systems, access to production factors, agricultural advisory services, local knowledge etc. are determinants of agricultural technology adoption and sustained use, ultimately impacting poverty reduction and improved livelihoods in both continents. It should be noted that this R&I Partnership considers social sciences as much as biological sciences. Examples include economy within research on trade issues, anthropology within research on diet changes, sociology within work on innovation processes, etc. In addition to social aspects referred above, other activities to be promoted include:

1. Social and cultural barriers to agricultural change (e.g. respect for tradition, diversity of cultural beliefs, responsibilities and social obligations among others)
2. Cultural background of farming systems (e.g. social structure, gender, social divisions and religion)
3. Nature of economic and social interests (e.g. formal and informal leaders, local interest groups, social expectations and culture)
4. Specific characteristics of farming systems (e.g. variety of farming practices according to cultural traditions, land tenure, issues of inheritance, ceremonies and festivals, and traditional means of communication, etc)
5. Factors in change (e.g. innovators, leadership, contacts with other cultures, communication, and population growth)"
6. Youth unemployment and exodus from rural to urban areas.

3. Implementation of the Research and Innovation Partnership

Disclaimer: Through this section, the Expert Working Group intention is to provide an independent input, recognising that it will be the task of the policy-makers of the EU-Africa HLPD Bureau to further develop this implementation plan, in view of the third meeting of senior officials of the EU-Africa HLPD (likely to be held in March 2016).

3.1. Introduction to the Policy context: the EU-Africa High Level Policy Dialogue on Science Technology and Innovation

This Partnership should be set in the context of the EU-Africa High Level Policy Dialogue (HLPD) on Science, Technology and Innovation (STI) between the European Union and the African Union, the EU-Africa HLPD being a key component of the Joint Africa EU Strategy (JAES).

This would give this Partnership legitimacy rooted at the highest levels of the political organisation of both continents but, at the same time, an obligation to be consistent with various policy developments both in Europe and in Africa:

2. The Science Agenda for African Agriculture (S3A), developed by the Forum for Agricultural Research in Africa (FARA) in support of the Comprehensive Africa
Agriculture Development Programme (CAADP) and of the Science, Technology & Innovation Strategy for Africa.

3. the European Union’s growth strategy (Europe 2020), in which science, technology and innovation play a prominent role, and in particular the launch of the “Innovation Union”, the EU programme for research and innovation, Horizon 2020, and the new EU development strategy “An agenda for change”.

The HLPD has also set a number of characteristics for this R&I Partnership. It has defined its thematic priority as “the role of STI in securing food and nutrition security and sustainable agriculture development, including water management”. And it has described its philosophy as “an integrated approach recognising the important cross-cutting nature of innovation/entrepreneurship, research infrastructures and technical competence building”.

In this context, to ensure that an effective and integrated R&I Partnership is initiated in the different research and innovation areas, and a truly equitable partnership is developed, great attention must be paid to its establishment and working modalities.

These modalities should follow a set of criteria (3.3), be implemented by mobilising, in the short/mid/long term, a tool box of mechanisms and instruments for its implementation (3.4), based on lessons learnt from existing initiatives (3.2).

3.2 Lessons learnt from past or current relevant STI collaborations or initiatives between or within Africa and Europe

Several on-going or recent STI collaborations or initiatives between or within Africa and Europe, and relevant to the purpose of the proposed partnership have been analysed. This information is captured in annex 2, which details the main elements of the networks, programmes and instruments studied and which summarizes their main characteristics presented in a Table.

One of the lessons learned are that many networks linked to agriculture research currently exist. Some include African and European Institutions (ERAfrica), some have been established at continental (FARA, ERA-Nets) or regional (SROs\textsuperscript{16}) scales. In general, those that include both continents are short-term projects while regional or continental networks are expected to have mid- and long-term duration. These institutional networks often have strategies that address general research priorities, approaches and capacity development needs.

Networking on more technical or specific issues has also been promoted (e.g. CARD and CAAST-Net Plus Projects) and involve research institutions as well as other stakeholders. There have also been extensive discussions on research priorities on various aspects of sustainable intensification of agriculture and nutrition in Europe and Africa. Addressing complicated issues by redefining the research approach is also possible (e.g. UK Sandpit model).

For research in developing countries, the CGIAR Research Programs (CRPs), involving various CGIAR Centres, are of special interest, but participation to CRPs of European and African National

\textsuperscript{16} Sub-Regional Organisations
Agricultural Research Systems\textsuperscript{17} have been limited, or at least below NARS expectations; this limitation requires to be solved\textsuperscript{18}.

Among the partnership approaches, three are of special interest: EDCTP, ERAfrica and JPI Water. All three address research, innovation and capacity building, and include co-funding mechanisms. This last characteristic has to be noted as, if there are several examples of research and innovation projects with participation of African and European Institutions, funding is generally European or International.

There are various examples of efforts on approaches to innovation, both public-public and private-public, within Africa (e.g. WAAPP, SSA-CP\textsuperscript{19}, AGRA, Global Alliance for Improved Nutrition) and within Europe (e.g. EIP-AGRI, UK Research Clubs). Some projects target specific systems (e.g. CARD, UNIBrain), although it may cover very diverse environments within the continent. EIP-Sustainable Agriculture is a new approach to innovation development in Europe that follows bottom-up approach and with elements that may be implemented globally. WAAP (implemented by CORAF in West Africa) also works on innovation, often through commissioned activities.

Capacity building is addressed in most programmes and projects but few specific for the exchange of EU and AU staff and students on equal basis. Regarding PhD and MSc, some programme offer the possibility of the “sandwich approach” by which the student spends part of the time in both continents. This has to be expanded (in volume) and be more balanced between Europe and Africa (choice of PhD topics relevant for both continents, co supervision by researchers of both continents).

From this analysis, it is possible to conclude that

1. Several specific models or tools have proved to be particularly successful and appropriate in managing R&I projects with joint participation of African and European Institutions.
2. The proposed R&I Partnership should be implemented not through a single mechanism but through a portfolio of mechanisms, tailored to select and incorporate those modalities / tool types, individually or in combination of various models, innovatively re-arranging and adapting them to the different activities and components of the Partnership.
3. All these mechanisms should follow 6 criteria, derived from these lessons learnt and presented in the § 3.3.

\textsuperscript{17} NARS are not limited to research institutes but also include universities and other public or private institutions involved in generating knowledge and strengthening R&I capacities.
\textsuperscript{18} For instance, several European research organisations (University of Liège, ETH Zurich...) have expressed their concern that there is currently no clear incentives for Europe-Africa research collaboration in agricultural research within the current funding strategy of the CGIAR centers.
\textsuperscript{19} Sub-Saharan Africa Challenge Programme
3.3 Criteria for selecting modalities

To be selected as forming part of this R&I Partnership, activities should fulfil the following criteria:

1. Joint interest\(^{20}\), joint governance\(^{21}\), joint investment for and by Europe and Africa;
2. Promoting a systemic approach to research and innovation;
3. Adapted to a programme level partnership;
4. Strengthening collaboration between researchers and other stakeholders;
5. Novelty and with a potential for leverage;
6. Focused on STI but within a vision for impact.

The R&I Partnership activities, fulfilling the above criteria, could be supported in the mid- to long-term, by a combination of three support modalities: Competitive call for proposals, Commissioned work, and targeted facilitation mechanisms.

All three modalities could be mobilised in synergy as they all have their positive and negative points making them more or less able to support specific activities:

- **Competitive call for proposals**
  1. “+” Transparent procedure; rewards for the “best”;
  2. “-“ A competitive system can work against the sense of partnership; risk of duplication or overlap between activities; not easily leading to rapid impact

- **Commissioned work/targeted funding**
  1. “+” Avoid the competition between teams in Europe and in Africa and therefore better promotes a feeling of partnership; easier to generate quick impact by focusing on “low hanging fruits”; can quickly strengthen the formation of critical mass of EU and AU researchers in a limited number of topics, creating at the same time a “boosting” effect for some partners with lower capacity for participation of partners;
  2. “-“ Choice of beneficiaries not very transparent and subject to influences.

Note that this modality has been implemented with success by DG DEVCO, by CORAF in West and Central Africa and is also commonly used by the Bill & Melinda Gates Foundation.

- **Enabling and facilitation mechanisms:**
  1. Establishing policies enhancing the mobility (long term and short term) of scientists and research staff;
  2. Developing adapted ICT tools, for instance promoting a support tool (could be a portal) for exchange of information, access to data, brokering R&I partnerships, or adding value to local knowledge\(^ {22}\);
  3. Joint research programming;
  4. Mechanism for African and European scientists to work together, and to interact with other public and private stakeholders (thematic workshops, mobility grants, exchange of students, innovation competition…). There is for instance the suggestion to work on the creation of an “African Research

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\(^{20}\) “Joint interest” could be defined as research leading to applications both in Africa and in Europe, or research on global (like climate change) or bi-continental (like movement of pests and pathogens between Europe and Africa) issues affecting or threatening FNS in both continents.

\(^{21}\) “Joint governance” implies the existence of an explicit agreement between African and European stakeholders (including but not limited to research institutes), regarding a common subject to be tackled, a work plan, a monitoring and reporting system (with accountability), a communication and policy outreach strategy…. Such agreement could be of “variable geometry” but with a mid to long term commitment.

\(^{22}\) Facilitation mechanisms will in particular include systems that enable information and knowledge to flow between innovators in Europe and in Africa. ICTs are necessary to deal with the “digital divide”, not especially only between researchers in Europa and Africa but in particular between innovators.
Area” which could benefit from lessons learnt from the European experience to promote the “European Research Area”.

All three support modalities could be used in the R&I Partnership. Careful attention should be paid to the adaptation between the specificities of the three support modalities. For instance, commissioned work (which may be implemented through a targeted competitive call) may be more adapted to strengthening capacities; open competitive call may be more adapted to upstream research, etc.

These support modalities could also be working in “tandem”. For instance a competitive call in one continent could be coordinated with a targeted funding in the other.

3.4 Potential instruments for implementing the Research and Innovation Partnership

Various instruments currently used by the EC, the AUC or member countries, between or within Africa and Europe, in multilateral or bilateral collaborations (Annex 2), can be mobilized for the development of this partnership, in the short to medium term, and also for structuring the proposed partnership platform, in the long term.

3.4.1 Instruments for the short to medium term:
In the short term, starting in 2015, it is proposed that the EC and the AUC use the following instruments to implement the road map.

1. Jointly funded competitive calls for research and innovation. This is in particular the case of the calls launched by the ERAfrica project (an ERANet between European and African countries). To be really effective in implementing this roadmap, funders should consider extending the ERAfrica but with a more significant funding component dedicated to the area of Food and Nutrition Security and Sustainable Agriculture. Current Joint Programming Initiatives (JPI FACCE, JPI Water and JPI HDHL) could include specific subjects within identified priority themes to promote the inclusion of African partners. The African Union Research Grants is another example of competitive call to be extended in budget, scope and modalities with other sources of funding to complement and eventually substitute for the EU funding, including from the AU Member States as well as from other partners and donors.

2. Jointly funded competitive calls for capacity development. The “RUFORUM” and “Intra Africa Academic Mobility Scheme” calls in Africa could support the implementation of the R&I Partnership by considering food and nutrition security and sustainable agriculture in the themes of their calls for proposals. A new programme for the co-supervision of PhD students, from both continents and with mobility in both directions, linked to existing projects and using the “sandwich” approach could also be tested.

3. Several Cooperation and Support Action (funded by the EC under the FP 7 or H2020 calls) can directly support the RoadMap. This is especially the case of the on-going projects CAAST-NET Plus (STI policy dialogue between Europe and Africa), PAERIP (joint research infrastructure), RINEA, etc, and of the soon to be launched (end of 2014/beginning of 2015) CSA on “Sustainable Intensification”. Some of these projects have limited budget (less than 1 million euro per project) and do not fund
large R&I activities but they support key targeted activities and ensure an effective
dialogue between the European and Africa STI communities, identifying priorities
(mapping, gap studies) and setting strategic R&I agendas. As the CSA on “Sustainable
Intensification” will only cover one of the three priority areas of this roadmap, it is
proposed to consider launching a call for two equivalent CSA: one on Nutrition and
one on Trade.

4. H2020 topics to support RoadMap in the new biennium 2016-2017 (e.g. “Evaluation
of innovation models for sustainable agriculture” in 2016).
5. African and European countries could decide to use their own national instruments
to fund elements of the R&I Partnership in the short-to medium-term.

Apart from these sets of instruments, others instruments have been implemented successfully in
Europe and in Africa, in the STI domain. This is in particular the case for Commissioned projects
funded by DEVCO (implemented by International Organizations or by legitimate consortium of
partners; example of PAEPARD or the Sub-Saharan African Challenge Programme (SSA-CP)) and by
CORAF, in particular through the World Bank funded WAPP program. These instruments, and others
like DEVCO’s Twinning instrument, have a potential to support the short/mid-term implementation
of the Roadmap. This will require a more thorough analysis, initiated in the § 3.2 but to be furthered
in the coming years by some specific analysis to be commissioned in the initiation phase of the
partnership. In order to quickly give an operational content to the Programme, it is proposed that at
least one top priority theme in each of the three areas be identified (if possible “low hanging fruits”
with potential for quick impact) in the short term and that corresponding relevant STI activities are
launched.

3.4.2 Instruments for the long term: models of cooperation platform.

In the long term, the partnership will lead to the creation of “platform” jointly funded by EU and
Africa public institutions, but with potential support from the private sector (including farmers’
organizations). It will ensure long term (10 years) support for the research-innovation Agri-Food
cell eco-system, promoting a vibrant community of STI actors between Europe and Africa.

Depending on further political negotiation, this platform may follow various models that can be
taken from Annex 2:

- Public-public models
  1. CORAF West African Productivity Partnerships
  2. European Innovation Partnership for Sustainable Agriculture (EIP-SA)
  3. Trust funds (like the GAVI initiative or the CGIAR programs)
  4. The European and Developing Countries Clinical Trials Partnership Programme
     (EDCTP)
- Public-Private models
  1. The Public Private Partnership for BioBased Industries
  2. Innovation Platforms promoted in Africa by CORAF, FARA, AGRA and other
     organizations
  3. Others like pooled instruments: UK research club model, African Enterprise
     Challenge Fund, GAIN.
One likely hypotheses is that the platform may be initially launched as bi continental Public Public partnership between the EC, the AUC and, on a voluntary basis, European and African Governments, but with legal framework enabling the opening of the partnership to the private sector and to foundations (like the Bill and Melinda Gates Foundation), either on a restricted ad hoc basis or as full partners.

3.4.3. Possible implementation plan

The proposal is to launch this EU-Africa partnership in the short term after political and financial negotiation between Europe and Africa.

Though it may only be possible to initiate a limited number of activities in this short term, it will be important:

1. to acknowledge, from the onset, the broad perspective of this partnership,
2. to find pragmatic solutions to enable, in the following years, adding new components as they emerge (with their respective institutional and funding mechanisms),
3. to progress in parallel (though possibly at different speeds) on the three thematic areas (sustainable intensification, agriculture and food systems for improved nutrition, agricultural trade),

- as well as on the horizontal (non-thematic) issues. Some of these non-thematic issues, like how to strengthen innovation processes, would start to be analysed in the context of the three thematic areas, for effectiveness and to allow “learning by doing”, but with a vision of supporting more broadly the EU-Africa STI partnership.

Timing:

Short term (First 2 years): Launch of the EU Africa Partnership, with two major components:

1. African and European scientists and stakeholders will jointly identify and design specific topics for collaboration relevant to the R&I Partnership. This will build on thematic meta-mappings, critically reviewed on the basis of the 5 criteria proposed in part 2
2. For sustainable intensification, this meta mapping will be done by the Sustainable Intensification CSA (see footnote 23);  
3. For nutrition and trade, and in the non-thematic areas of innovation, communication, and research infrastructure, meta-mappings will have to be carried out, by appropriate means, at the beginning of the partnership.
4. The EC and the AUC will put in place a process to ensure that new initiatives promoted by them and related stakeholders, are coherent with the ambitions of this partnership

Medium term (Years 3-6): Set-up of a new funding and institutional mechanism to support

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23 Including the launch of a 2 years Coordination and Support Action (CSA, funded under Horizon 2020) on sustainable intensification, aiming at the “creation of a long-term research partnership between Europe and Africa (…) on research and innovation on sustainable intensification pathways in agro-food systems”. This CSA will be strongly linked to the Roadmap by having HLPD members joining the CSA “policy support group”, by bringing into the policy arena (for discussion, further elaboration and possible approval) the documents to be produced by the CSA (Strategic Research and Innovation Agenda, partnership governance structure, etc) and by analysing how to extend to other thematic areas (especially Nutrition, Trade) what may be proposed by the CSA regarding “sustainable intensification”.

24 Such meta-mapping would make use of and add value to the many mapping exercises already available in Europe and in Africa.
1. the full scale implementation of recommendations on Sustainable Intensification, Nutrition, and Trade, including through a jointly funded call for proposals,
2. the implementation of a jointly funded non-thematic partnership initiative (in at least two or three areas like communication, innovation, research infrastructure, capacity strengthening...).

Longer term (From Year 7):

1. Expansion of the programme to support EU-Africa partnerships in new thematic and non-thematic areas.
2. Research project will lead to innovation and upscaling initiative, to generate significant impact in both continents.

3.5 Ensuring the ability of the R&I Partnership to evolve as it grows (both on institutional aspect and content) in the short/mid/long term.

The R&I Partnership is set to expand over the next 10 years, and will therefore need to evolve in its organisation. The R&I Partnership model could be of “variable geometry”, allowing entrance and exit of partners at different stages, but with incentives to maintain linkages over a long time period in order to allow for tangible results to be delivered.

The use of a combination (mix) of various models (supported by a range of instruments) each being best adapted to its type of activity (capacity strengthening, infrastructure, research project, etc...) will allow participation of some partners (funders) to only some components of the R&I Partnership while the activities supported through various mechanisms will remain aligned with the goal and purpose of the R&I Partnership.

Such “institutional agility” will require:
1. Adopting the most appropriate modalities for each type of activity
2. Implementing regular governance reviews, including through independent external evaluations
3. Setting up a Monitoring & Evaluation and Learning framework
4. Embedding the R&I Partnership in the HLPD process (or its successor) to ensure a permanent link with EU and AU authorities

The administration of a Research and Innovation Partnership would become important in the long-term depending on the type of platform that will be chosen. It would in that case be necessary to put in place a strong and well supported administrative and managerial structure, including capacity to manage projects, communication infrastructures and ICT Monitoring and Evaluation would also have to be part of the R&I Partnership and is described below (chapter 4).


In the context of this Roadmap, it is only possible to present the principles on which the Monitoring, Evaluation and Impact assessment mechanisms for the proposed R&I partnership will be built. Further development will be required, at a later stage, under the leadership of the HLPD Bureau and with the participation of the stakeholders.
The purpose of Monitoring, Evaluation and Impact Assessment is to check the progress of activities implemented by the R&I Partnership, to assess their effectiveness and impact, and incorporate new learnings.

This will be done using an overall monitoring and evaluation (M&E) framework, standard project management tools, reporting procedures, progress reports, etc. Key activities in monitoring, evaluation and impact assessment of the R&I Partnership will therefore be related to the establishment of proposal log-frame, with its designated top priorities, strategic and specific objectives, thematic activities and outputs.

In particular, the implementation of the Roadmap for this R&I Partnership will be measured on outputs and Impact Indicators related to:

1. The impact of the research on the communities
2. The uptake of the research to scale
3. The effectiveness of the functional framework for improved coordination of the diversity of European- and African-supported research and innovation projects;

- The effectiveness of the multidisciplinary collaborative research and innovation project teams and their ability to mobilize the diversity of stakeholders, to organize them around research themes and to source funds;

1. The extent to which the capacities (human, organisational, institutional, financial, infrastructural and, network) for collaboration among African and European research and innovation communities have been enhanced;
2. The extent to which the mechanisms and the capacities that support mobilization of knowledge(s) for innovation are operational;
3. The ability and the effectiveness of the R&I Partnership to evolve (both on institutional aspects and contents) in the short/mid/long term, adapting by using the most appropriate modalities.

The responsibility for Monitoring, Evaluation and Impact assessment of the R&I Partnership lies with the HLPD Bureau.

Other stakeholders could provide their perspectives as well. It is important to monitor progress continuously and report back to the stakeholders on performance so that appropriate measures can be put in place to rectify the gaps identified.

Since this R&I Partnership is set to evolve in the short/mid/long term and to be supported through various instruments, M&E tools will need to be devised to suit specificities.
5. R&I Partnership Logframe:

5.1 Tree of objectives: The vertical logic of the Roadmap for the EU-Africa R&I Partnership on research and innovation, with an initial focus on food and nutrition security and sustainable agriculture

Enhanced contribution of science, technology & innovation to improving food and nutrition security and sustainable agriculture

The expected changes in behaviour that the Programme will bring about

African and European stakeholders, in particular researchers and innovators, jointly design and execute a research and innovation agenda - to which they both contribute expertise and resources – that generates options that promote development agendas on both continents

What the Programme will deliver

Assumptions remain true

A framework for improved coordination of the diversity of European- and African-supported research projects on agriculture and food security

Multidisciplinary collaborative research and innovation projects organized around research themes that draw out the most important shared interests in sustainable agriculture and food and nutrition security in both Europe and Africa

Enhanced organisational capacities for collaboration among African and European research scientists in the identified priority research areas

Mechanisms and capacities that support mobilization of knowledge(s) for innovation

Partnership programme able to evolve in the short/mid/long term, adapting according to most appropriate modalities

Assumptions remain true
5.2 Detailed Logical framework \(^{25}\) for the Roadmap for the EU-Africa R&I Partnership on research and innovation, with an initial focus on food and nutrition security and sustainable agriculture

The “Means of Verification” column includes indicators/metrics which allow assessment of the proposed mechanisms for Monitoring and evaluation, this way linking automatically and permanently to the M&E framework.

<table>
<thead>
<tr>
<th>Narrative summary</th>
<th>Indicators</th>
<th>Means of Verification</th>
<th>Important assumptions</th>
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<tbody>
<tr>
<td><strong>Principle Objective/ Goal/ Development Objective</strong></td>
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<tr>
<td>Enhanced contribution of science, technology &amp; innovation to improving food and nutrition security and sustainable agriculture</td>
<td>1. Increasing demand for options generated by the R&amp;I Partnership by beneficiaries identified at the beginning of implementation of each funded project</td>
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<td></td>
<td>2. Adopters (disaggregated by gender and poverty status) of options generated by the R&amp;I Partnership significantly and sustainably increase their levels of food and nutrition security</td>
<td>• Impact assessment and baseline surveys</td>
<td></td>
</tr>
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<td></td>
<td>3. Users (disaggregated by gender and poverty status) of options generated by the R&amp;I Partnership have a significantly higher and sustainable level of nutrition security than non-users</td>
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<td></td>
<td>4. There is a higher level of policy-level support for sustained Africa-Europe collaboration `and partnership in science, technology and innovation as a mechanism for enhancing food and nutrition security as well as sustainable agriculture</td>
<td></td>
<td></td>
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<tr>
<td><strong>Purpose/ Specific Objective</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>African and European scientists</td>
<td>1. A joint Africa-Europe Research and Innovation Partnership</td>
<td>• M&amp;E reports from</td>
<td>• Complementary</td>
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jointly design and execute, together with other stakeholders, a research and innovation agenda - to which they both contribute expertise and resources – that generates options that promote development agendas on both continents

that addresses an agenda that can generate options for: (i) moving beyond an “inputs based” intensification towards a “knowledge based” intensification (ii) agriculture and food systems that support healthy nutrition (iii) improvement of agricultural markets and trade between Africa and Europe, and (iv) cross cutting areas - including innovation, knowledge systems, collaborative institutional development **being implemented**

2. The implemented research **generates options** for scaling up and out from the [insert time] year of commencement of funding

3. The **utilization (at pilot sites/platforms) of options generated** by the funded research in innovation activities that are aimed at improving food security, nutrition security and sustainable agriculture shows a progressive increase over time in both Africa and Europe

4. R&I Partnership gets **progressive increase in endorsement and/or support from funders**, based on evidence of effectiveness of the institutional innovations, lessons learnt and potential for impact

| Results | 1: A framework for improved coordination of the diversity of European- and African-supported research and innovation projects on agriculture and food security developed and functional | 1.1. Institutional arrangements that foster joint interest, joint governance, joint investment, promoting a systemic approach to research and innovation, program level partnership, strengthening collaboration between researchers and other stakeholders (including private sector), novelty and potential for leverage developed by [insert time] | 1.2. A balanced and appropriately qualified African-European R&I Partnership Coordination team in place by [insert time] | 1.3. Tools for supporting collaboration (including but not limited to tools for planning, monitoring, evaluation and leaning) developed and in use by [insert time] | 1.4. Matchmaking mechanism for enabling best-fit partnerships | 1. Governance and management guidelines and manuals | 1. Governance and management M&E reports | • Governance and management guidelines and manuals | • Governance and management M&E reports | • Incentives for partnership research activities for both African and European scientists exists | • Technology adoption surveys | • Beneficiary (including donor) assessment surveys | • A culture for utilising research outputs in income growth and rural development options (innovation) is enhanced |
between African and European institutions for developing and implementing joint projects developed by [insert time]

1.5. A management information system for the R&I Partnership developed and operational by [insert time]

2: Multidisciplinary collaborative research and innovation projects mobilizing the diversity of stakeholders and organized around research themes that draw out the most important shared interests in sustainable agriculture and food and nutrition security and with the greatest possibility of equitable collaboration and uptake at national and regional levels in both Europe and Africa funded

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<tr>
<td>2.1.</td>
<td>In both Africa and Europe, at least [insert number] projects generating options for which there is objectively derived indication that they can have impact for moving beyond an “inputs based” intensification towards a “knowledge based” intensification; funded in partner institutions that meet the partnership participation criteria and commencing in [insert time]</td>
</tr>
<tr>
<td>2.2.</td>
<td>In both Africa and Europe, at least [insert number] projects generating options for which there is objectively derived indication that they can have impact for agriculture and food systems that support healthy nutrition; projects involving partner institutions that meet the partnership participation criteria and commencing in [insert time]</td>
</tr>
<tr>
<td>2.3.</td>
<td>In both Africa and Europe, at least [insert number] projects generating options for which there is objectively derived indication that they can have impact for improvement of agricultural markets and trade between Africa and Europe; projects involving partner institutions that meet the partnership participation criteria and commencing in [insert time]</td>
</tr>
<tr>
<td>2.4.</td>
<td>In both Africa and Europe, at least [insert number] projects developing facilitation mechanisms for which there is objectively derived indication that they can have impact for cross cutting areas - including innovation, knowledge systems, collaborative institutional development -; projects involving partner institutions that meet the partnership participation criteria and commencing in [insert time]</td>
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3: Organisational capacities (governance, institutional,

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| 3.1. | Organisational capacity needs assessment for identifying gaps in the requirements for equitable and sustainable development | • Exante impact assessment reports  
• M&E reports  
• Partnership Beneficiary assessments  
The identified priority research themes for partnership activities do not change  

#### 3.1. Organisational capacity needs assessment for identifying gaps in the requirements for equitable and sustainable development

- Biennial capacity  
Developed capacity does not “decay”
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<tbody>
<tr>
<td>manager, human, physical, financial, information, network</td>
<td>collaboration - in the priority areas - among African and European institutions in the R&amp;I Partnership undertaken and completed by [insert time]</td>
<td>reviews • Biennial organisational performance assessments due to external factors (such as conflicts, disasters, pandemics etc.)</td>
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<tr>
<td>3.2. A budgeted strategy and operational plan for addressing the identified organizational capacity needs developed and its implementation started by [insert time]</td>
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<tr>
<td>3.3. All the partner institutions have the governance, managerial, institutional, monitoring, evaluation and learning systems that meet the set standards for participating in the R&amp;I Partnership before they commence participation in the R&amp;I Partnership</td>
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<tr>
<td>3.4. Gender-balanced human resource capacity needed to sustain equitable collaboration (following the subsidiarity principle) between Africa and Europe in the areas of the proposed priorities for shared research and innovation activities attained by [insert time] and sustained thereafter</td>
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<tr>
<td>3.5. Each partner institution has the infrastructure, equipment and supplies that they need to effectively and efficiently play its part in implementing the R&amp;I Partnership research activities following the subsidiarity principle by [insert time] and sustained thereafter</td>
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<tr>
<td>3.6. Each partner institution has the information resources they need to be able to participate in the R&amp;I Partnership activities by [insert time] and sustained thereafter</td>
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<tr>
<td>3.7. All the partner institutions are internally networked through physical and virtual means and also linked to other external networks relevant to the priority research areas by [insert time] and sustained thereafter</td>
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<tr>
<td>4: Mechanisms and capacities that support mobilization of knowledge (s) for innovation developed and operational</td>
<td>4.1. A joint study to investigate the determinants of use/ failure of use of research results in the priority research areas for innovations targeting agriculture-driven development objectives in both Africa and Europe undertaken, and prioritised recommendations made (and validated) on the</td>
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<td>• Study report • Validation workshop report Incentives and effective demand for investing in innovations in the areas addressed by</td>
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| 4.2. | By [insert time] appropriate systems and mechanisms for supporting innovation (including but not limited to innovation brokerage, multi-stakeholder innovation platforms, public-private partnerships, diversified funding, intellectual property protection) focusing on the set development agendas in Africa and Europe developed and operational | - Innovation capacity assessment  
- M&E of innovation promotion activities by partners |
| 4.3. | In Africa and Europe the involvement of women, youth, elderly, disadvantaged and marginalised groups in multi-stakeholder innovation processes progressively increases throughout the life of the R&I Partnership | - M&E reports |
| 4.4. | In both Africa and Europe there is progressive increase in the participation of the private sector in innovation processes that support agriculture-driven development objectives | - M&E reports |
| 4.5. | In both Africa and Europe there is progressive increase in the use of appropriate information and communication technologies to support innovation processes | - M&E reports |
| 5: R&I Partnership able to evolve (both on institutional aspect and content) in the short/mid/long term, adapting by using the most appropriate modalities | 5.1. A monitoring, evaluation and learning system strategy and plan developed by end of year 1 of the R&I Partnership and implemented routinely thereafter | - M&E reports  
- External evaluation  
- Lesson learning reports |
| | 5.2. A information, communication and knowledge management strategy and plan for the R&I Partnership developed and operational by end of year 1 of the R&I Partnership | |
| | 5.3. An advocacy and lobbying strategy and plan directed at mobilising support and resources for sustaining the R&I Partnership developed and in operation by end of year 1 | |
| | 5.4. Lesson learning events undertaken at least once every year and the lessons learnt in all areas of organisational performance communicated to stakeholders by the most appropriate means | |
Annex 1:

Terms of Reference for an Expert Working Group on Food and Nutrition Security, and Sustainable Agriculture

Following the 2nd meeting of the EU-Africa HLPD on STI, November 2013

Based on HLPD ‘way forward’

HLPD Bureau, 11/03/2014 (HLPD Bureau, final version adopted at HLPD Bureau on 11/03/2014)
Background and context:

The second meeting of the EU-Africa High Level Policy Dialogue (HLPD) on Science, Technology and Innovation took place in Brussels on 28-29 November 2013. The meeting has brought together around 90 senior officials from Research and Innovation Ministries from the African Union and the European Union member states as well as the African Union Commission and the European Commission.

The meeting was called to review cooperation and set new priorities ahead of the EU-Africa Summit 2014 (2-3 April). Senior officials agreed to work towards a long term, **jointly-funded and co-owned research and innovation partnership with a particular focus on promoting food and nutrition security and sustainable agriculture** as a first priority. In view of this, the decision was taken to set up an Expert Working Group (EWG) that would be tasked to prepare a roadmap setting out short-, medium-, and long-term milestones in support of this goal. The roadmap is due for September 2014.

The concept note prepared prior to the meeting as well as the conclusions and the ‘way forward’ that were adopted at the meeting can be found in annex.

The ‘way forward’ sets out clearly the objective and aim of the partnership as well as the role and task of the EWG and the approach that should be taken. These Terms of References are an addition to the ‘way forward’ to enhance clarity and were subsequently prepared by the HLPD Bureau.

Output:

The EWG should produce an electronic version of a roadmap setting out the short-term (2015), medium-term (2017) and long-term (2020 and beyond) steps in support of the implementation of a jointly funded and co-owned research and innovation partnership with a particular focus on food and nutrition security and sustainable agriculture.

The roadmap should be short and concise (maximum 15 pages) and presented in the form of a logical framework. This should include all the elements a logical framework usually contains (the way forward article 4.1.1) whenever realistically possible, such as time-specific objectives, detailed activities, outputs and outcomes, milestones, critical dependencies, progress indicators, mechanisms for monitoring and evaluation, criteria of success, as well as key risks and assumptions for the partnership on food and nutrition security and sustainable agriculture. The timeline should also describe time-specific input-requirements and the responsibilities of the relevant actors in relation to temporal progression. Explanations and comments on each element of the logical framework should figure directly in the related boxes.

The experts will also be invited to present and comment the roadmap to the EU-Africa HLPD Bureau once it is finalised.

The roadmap will be presented for endorsement by the senior officials at the next meeting of the EU-Africa HLPD on STI, most probably in the first semester of 2015.

Scope and focus:

The scope and focus of the roadmap on thematic sub-challenges and cross-cutting topics are set out in article 3 of the ‘way forward. The scope of the roadmap should extend beyond purely academic cooperation to consider:
Achieving mutual benefit (noting that primary drivers include reinforcing the broader Africa-EU partnership in research and innovation and to foster collaboration for mutual benefit in research and innovation, rather than development cooperation);

- Improving collaboration on information exchange and knowledge (including data) management;
- Improving the policies, processes and instruments to create a conducive operational and financial environment for research and innovation collaboration;
- Strengthening communication within and between constituencies and dissemination of the outputs and data from on-going initiatives in the domain;
- Building necessary future skills and capacities for EU-Africa cooperation in research and innovation;
- Implementing the roadmap within the current political framework and employing the existing and likely future landscape of instruments for cooperation;
- Linkages and opportunities for synergies with other areas of policy (and the policy instruments) such as development cooperation, trade and foreign relations;
- Opening-up to other stakeholders such as the private sectors in order to mobilise additional resources (financial and technical).

Composition, selection and appointment of members of the Expert Working Group

The EWG has strictly limited membership (10) with the aim of convening a small and efficient group that includes among its members all the key skills required to compile a roadmap as described herein. Following the second meeting of the EU-Africa HLPD in November 2013, the participating AU and EU Member States as well as the African Union Commission and the European Commission were invited to suggest names of high level experts. The final selection of experts was done by the HLPD Bureau that was guided by article 4 of the HLPD ‘way forward’ and driven by the following criteria:

- Expertise: individual members will be acknowledged experts, having competencies in specific areas of relevance to the roadmap: food and nutrition security, sustainable agriculture, water and innovation; research infrastructures
- Key skills: Collectively, the group should demonstrate all the key skills required to compile a roadmap: knowledge of EU/AU institutions and research programmes, knowledge of best practice in collaboration and cooperation, research communication, knowledge exchange, uptake and impact, science-policy interface, capacity-building
- Regional balance: Equal representation from Africa and EU.
- Gender balance: Without compromising other criteria, the selection process will strive for gender balance.
- Geographic and linguistic balance: Where relevant, notably for Africa, EWG members will be selected to achieve sub-regional and linguistic representation.
- Sectors: The EWG should include representatives of the scientific community, civil society, the public sector and the private sector.

The final decision of its composition was taken by the HLPD Bureau on 11/03/2014.

Members of the EWG are appointed by the HLPD Bureau in the first instance for the period March to September 2014, with scope for continuation according to HLPD needs for the partnership. In the first instance, it is expected that each expert will be required to commit a maximum of 12 days for the work.

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26 Due to the absence of the private and civil society sectors in the working group, consultation of these sectors should be sought at the draft stage of the input to a roadmap.
EWG members participate in their own right, on the basis of their particular expertise, and do not represent either their organization or their country. Participation in the EWG is voluntary. Members may resign from the EWG at any time, but are asked to provide the HLPD Bureau with ‘reasonable’ advance notice.

**EWG reporting and liaison:**

The EWG should appoint two contact-points at the kick-off meeting, one from the EU and one from Africa. Liaison between EWG and HLPD Bureau should then preferably pass via the contact-points of the EWG and the co-chairs of the HLPD Bureau.

The EWG should provide brief monthly progress reports during the period of the study which will feed into meetings of the EU-Africa HLPD Bureau.

**Language:**
The EWG should report in English. Translation into other languages if necessary will be assured by the HLPD Bureau.

**Location:**
It is anticipated that the EWG will mainly operate in a virtual configuration, with physical meetings on a small number of occasions, including at kick-off.

**Support, resources and financing:**
The HLPD Bureau and the European Commission/African Union Commission will ensure secretariat services of the EWG during the period of the study.
All essential and legitimate direct costs of the expert working group (travel costs and per diems for a maximum of 3 trips (2 to Europe and 1 to Africa) will be paid for. In certain cases financial support to remunerate the work to be undertaken by the experts may be sought. This will only be allowed were the expert is not already receiving a salary from his/her institution.
Annex 2: Brief description of main elements of STI collaborations or initiatives between or within Africa and Europe

Table 1. STI collaborations or initiatives between or within Africa and Europe: tool type and fulfilment of criteria

<table>
<thead>
<tr>
<th>Africa, Europe focus</th>
<th>TOOL TYPE</th>
<th>Networking Programme</th>
<th>Project</th>
<th>Research</th>
<th>Innovation</th>
<th>Capacity building</th>
<th>Information/Database</th>
<th>Infrastructures</th>
<th>CRITERIA</th>
<th>Equal Europe-Africa</th>
<th>Systemic approach</th>
<th>Program level</th>
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The African NARS strengthened regional collaboration through the formation and development of sub-regional organizations (SROs), and through the creation of the Forum for Agricultural Research in Africa (FARA). In general, SROs operate through research networks, programmes and projects, involving NARs and CGIAR centres. Four SROs are linked to FARA:

- **West and Central African Council for agricultural Development (CORAF/WECARD, [www.coraf.org](http://www.coraf.org), 21 countries).** With strategic plan (2007-2016) developed in the context of CAADP, CORAF encompasses conventional research, innovation platforms, policy, markets, capacity strengthening, coordination, advocacy, knowledge management and the involvement of a broad base of stakeholders.

- **Association for Strengthening Agricultural Research in East and Central Africa (ASARECA, [www.asareca.org](http://www.asareca.org), 11 countries).** Objective: to develop policies and programs aimed at deepening co-operation in agricultural research and policy among its member countries for the mutual benefit of all the stakeholders in the agricultural sector. Activities are mostly focus on specific commodities (e.g. bananas), cross-commodity agricultural topics (e.g. biotechnology) or natural resources.

- **North African members of AARINENA (NASRO, [www.aarinena.org](http://www.aarinena.org), 6 countries)**

- **Centre for Coordination of Agricultural Resources and Development for Southern Africa (CCARDESA, [www.ccardesa.org](http://www.ccardesa.org), 15 countries).** Leads Agricultural Productivity Program for Southern Africa (APPSA), coordinates Agricultural Research and Development in the SADC region and recognizes the role of National Agricultural Research Systems in responding to releasing the CAADP especially pillar 4 which deals with technology generation and adaption.

**FARA** ([www.fara-africa.org](http://www.fara-africa.org)), established in 2001, brings together major stakeholders in agricultural research and development in Africa. FARA reaches out to non – research stakeholders through continental platforms of farmer’s organizations (PAFO), private sector (PanAAC) and the non-governmental organizations (Pan NGOC). FARA has developed a **ten-year Strategic Plan (2007 – 2016)** and has five result areas according to priorities of FARA’s stakeholders and clients, and to FARA’s comparative advantage. These are to ensure the establishment of:

- Appropriate institutional and organizational arrangements for regional agricultural research and development

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• Broad-based stakeholder access to the knowledge and technology necessary for innovation
• Strategic decision making option for policy institution and markets
• Human and institutional capacity for innovation
• Platforms for agricultural innovation

FARA's work is supported by World Bank, African Development Bank (AfDB), DFID, EC, CIDA, USAID, DANIDA, IDRC, Rockefeller Foundation, Syngenta Foundation for Sustainable Agriculture, Bill and Melinda Gates Foundation, the Governments of Italy, Ireland, Germany, Netherlands, Norway, France, Sierra Leone, and other multi-lateral and bi-lateral donors.

FARA’s Networking Support Functions (NSFs) includes one or more projects in which SROs or NARs may be involved:

**NSF2: Access to knowledge and technologies**

• **RAILS** - Regional Agricultural Information & Learning Systems. This six-year (2007–2012) African Development Bank (AfDB) funded project was designed to fill current gaps in the rural community–NARS–regional–continental–global information chain. It was expected to improve the utility of web-based information and use of traditional communications tools, including FARA's website.

• **eRAILS** ([www.erails.net](http://www.erails.net)) is a major African portal for agricultural innovation, funded by AfDB. The project "eRAILS phase II" launched an information exchange service in 13 pilot countries in SSA to build a knowledge base in collaboration with 30 farmers' organisations and a large number of experts from the selected countries. During detailed household interviews, a thousand farmers indicate production constraints and are providing valuable data.

• **DONATA** (Dissemination of New Agricultural Technologies in Africa) was a six-year (2007–2013) AfDB-funded project to accelerate the dissemination of agricultural technologies across the region. The principle of creation of Innovation Platforms for Technology Adoption (IPTA) on segments of each value chain, with the task of inclusive monitoring and evaluation, lesson learning and experience sharing was central in the DONATA project. The project was led by FARA, managed by the SROs, and implemented by the NARS. DONATA is component 2 of PSTAD project. The agriculture development actors include farmers and post-harvest; extension and advisory services; policy-makers, decision-takers; and agribusinesses.

• **AfricaAdapt** ([www.africa-adapt.net](http://www.africa-adapt.net)) is an independent bilingual network (French/English), focused exclusively on Africa, and with the aim is to facilitate the flow of climate change adaptation knowledge for sustainable livelihoods between researchers, policy makers, civil society organisations and communities. Hosted by FARA, Environment and Development in the Third World (ENDA-TM) and IGAD Climate Prediction and Applications Centre (ICPAC), the network is jointly funded by DFID and the International Development Research Centre (IDRC) Climate Change Adaptation in Africa Programme. Activities use the latest web-based applications, face-to-face interactions, and other media for sharing resources, facilitating learning, and strengthening the African adaptation community.

• **CARD** - Coalition for African Rice Development ([www.riceforafrica.org](http://www.riceforafrica.org)) was established in 2008 with the aim of doubling the rice production in Sub-Saharan Africa by 2018. It is a consultative group of bilateral and multilateral donors and African/international institutions (AGRA, AfricaRice, AfDB, FAO, FARA, IFAD, IRRI, JICA, JIRCAS, NEPAD and WB) and has 23 member countries, all African. Based in 3 pillars: a) capacity development of rice sector; b) better coordination among relevant stakeholders; c) provides NO funding but increased
investment through creation of enabling environment – **networking, including private sector.** It uses a **value-chain approach.** Progress 2008-2013: rice development strategies prepared in 21 countries; capacity development in relevant technical areas, mainly through South-South cooperation; pilot enabling environment in mechanization in Cameroon and Tanzania (FARA, IRRI, JICA). At country level, integration into CAADP. Outlook for 2013-2018: accelerating NRDS implementation (including capacity development); creation of enabling business environment (including, facilitation of dialogues between Public and Private sector); continuous capacity development

**NSF4: Capacity strengthening**

- **SCARDA** (Strengthening capacity for agricultural research and development in Africa) was implemented over a 2 ½ - year duration beginning in March 2008 with the purpose of improving the capacity and performance of participating NARS in key areas of their AR4D functions. Funded by DFID and coordinated by FARA, it was implemented in 12 focal institutions spread out in 10 African countries. The main outcome of the Inception Phase was a detailed **capacity strengthening programme** and structures for its implementation. The approach differs from standard capacity building projects in that it embedded the capacity strengthening interventions in a change management process, which started with a rigorous institutional analysis of target institutions, identifying their weaknesses and capacity strengthening needs.

- **UniBRAIN** pioneers a new approach to **promoting agricultural innovation** and improving tertiary **agribusiness education** in Africa. It links university education, research and business in sustainable agriculture. **UniBRAIN Incubators** function as training, research and advisory centres for small and medium enterprises (SMEs), start-ups and enterprises undertaking change and innovation. They are also businesses in their own right providing problem solving, testing and validation, and business development services to innovators and agribusinesses. UniBRAIN promotes a value chain approach. Supported by Royal Danish Ministry of Foreign Affairs (Danida), facilitated by a team of seven partner institutions, and hosted by FARA. Supports **6 pilot agribusiness innovation incubator consortia** (AIIC), which work in critical African agricultural value chains: coffee, banana, sorghum, livestock, non-timber forestry products, cereals and fruits, and tropical fruit and vegetables.

**NSF5: Partnerships and strategic alliances**

- **PAEPARD** *(paepard.org)* - Platform for **African-European partnership** on AR4D, it mobilises resources for priority projects that combine African and European institutional and financial resources for mutually advantageous projects. PAEPARD **supports the establishment of innovative partnerships** of African and European stakeholders that engage in agricultural innovation and collaborative research to address shared challenges and opportunities of the partners involved. Successful applicants benefits from: 1) Support for participation in a facilitated “partnership inception workshop”; 2) Support for capacity strengthening, including training of an innovation-facilitator proposed by the partnership; 3) Support for facilitation and coordination of partnerships. PAEPARD is coordinated by FARA in collaboration with Agrinatura, a consortium of research and education organizations in Europe. The initiative is supported by the European Union.

- **SSA CP** – The Sub-Saharan Africa Challenge Programme was initiated in 2004, with the aim of facilitating a substantial increase in the impact of ARD for improved rural livelihood, increased food security and sustainable natural resource management throughout Sub-Saharan Africa. It proposed a new approach to conduct agricultural research. This approach entails a multi-sectoral orientation to problem diagnosis, and draws on integrated approaches using “hard” and “soft” sciences to provide solutions, while making the most of
the available resources. This concept requires systemic interaction among all stakeholders around a specific commodity or production system. The SSA CP proposed to create the “innovation platforms” (IPs). The research is organized around four projects: one Meta-Analysis project focusing on the proof of concept and three PLS projects (each with three subprojects) in three different regions of sub-Saharan Africa. The projects were headed by Africans or CGIAR institutions. The SSA CP has been evaluated (www.fao.org/docrep/014/i2350e/i2350e00.pdf): the IPs have to varying degrees achieved a functional partnership across quite different organizational actors, a bottom-up approach to problem diagnosis and testing of potential solutions, real ownership by farmers and other actors of the IP, and a framework for integrating innovations in productivity, markets, and NRM.

WAAPP (CORAF/WECARD). The West Africa Agricultural Productivity Program (WAAPP) led by CORAF/WECARD is an initiative of ECOWAS supported by World Bank for a period of 10 years (2008-2018) divided into 2 phases in order to facilitate the contribution of its member’s states in implementing CAADP Pillar IV for the improvement of agriculture research, technology dissemination and adoption, in particular, contribute to sustained productivity increase in the top priority commodity sub-sectors as identified in an IFPRI/CORAF quantitative study. It has four components:

1) Enabling conditions for regional cooperation in the generation, dissemination and adoption of agricultural technologies with the aim at strengthening the mechanisms and procedures for the exchange of technologies, so as to allow participating countries to benefit fully from the regional cooperation in technology generation and exchange.

2) Promotion of National Centers of Specialization. It will support the upgrading of the National Centers of Specialization into Regional Centers of Excellence.

3) Support to demand driven technology generation, dissemination and adoption. It aims at strengthening priority-focused demand-driven agricultural R&D and scale-up technology dissemination and adoption within participating countries.

4) Programme coordination, management and monitoring and evaluation.

The key components 2 & 3 are implemented through the mechanisms of the competitive and commissioned projects according to the general criteria such as the participation of at least three NARS of West Africa, Gender mainstreaming, capacity strengthening of the different stakeholders of the project. The specific criteria used are related to the scientific quality of the project, the team of the project and its Leader institution, the budget du project, Environmental and social impacts etc. The commissioned projects are also selected after a thorough evaluation among a limited number of institutions on the basis of their professional competency and technical expertise for solving specific problems of research for development.

Main achievements: Government funded with WB facilitation; Large scale project with strong regional integration connotation in West Africa & strong potential for driving transformational change; Implemented at country level under coordination of CORAF/WECARD with strong control mechanisms; Addresses perceived challenges to agricultural productivity under reduced transactional costs; Attracts private sector investments and international donors.

Some deliverables: A total financial resource mobilization of over $456 million by 2013; 9 National Centers of Specialization with mandate to lead technology generation and use of the priority staples established; 300 research scientists have been mobilized and working on the nine staples in the Centers of Specialization; 65 yield enhancing technologies developed/improved and made available to participating countries; 230 000 ha covered with improved technologies; promotion of
technological marketplace allows buying and selling of technologies relevant to value chain systems; Countries are implementing technology dissemination and adoption plans.

Lessons learned:
- The use of competitive and commissioned projects on a transparency base allows the full participation of all the stakeholders of CORAF/WECARD (NARS, ARIs, CGIAR, Private Sector etc.) to successfully implementation of the WAAPP as shown by its deliverables which are contributing to the achievement of its purpose;
- Following the successful implementation of WAAPP 1A (Ghana, Mali, Senegal), all the 15 countries of ECOWAS are now involved in the programme which also includes Mauritania;
- CORAF/WECARD has been reinforced in its role for the coordination and capacity strengthening of AR4D in West Africa;
- Recognized as a model for sustainable investment in agricultural research for development, WAAPP has been adopted by other Sub Regional Organization such as ASARECA which is implementing the EAAPP (East Africa Agricultural Productivity Program). On the request of Central African States, a Central Africa Agricultural Productivity Program (CAAPP) which will be coordinated by CORAF/WECARD is also in preparation.

NEPAD (Centres of Excellence) launched a specific programme for identifying and reinforcing Research and Development capacities in Africa through building regional networks of Centres of Excellence. In the case of Water Sciences, calls of interest were launched in order to identify and appoint Centre of excellences; two regional networks were set up since 2009. In the case of Agriculture, there seem to be no parallel exercise. Nevertheless, the NEPAD/ABI (African Biosciences Initiative) is being implemented through establishment of regional networks of centres of excellence throughout the continent, e.g. BecANet Hub network (24 research projects on crops and livestock) and NABNet network (biotic and abiotic stress tolerant bio-fortified barley varieties, iron bio-fortified and drought tolerant transgenic plants, genetic risk factors of type II diabetes, date palms against major pathogens, and bio-insecticides for biological control).

The African Union Research Grant Programme was initiated in 2011 and aims to support the implementation of Africa’s Science and Technology Consolidated Plan of Action and its lighthouse projects as well as to develop African Union Council capacity for managing research grants. The Programme is led by the Department of Human Resources, Science and Technology and was formulated as one of the lighthouse projects and was identified among the early deliverables in Partnership No.8 on Science, Information Society and Space of the EU-Africa Joint Strategy and its Action Plan, Lisbon 2007. It is financed through the Financing Agreement between the European Commission and the African, Caribbean and Pacific Group of States. In the Open Call for proposals issued by African Union in 2011 and 2012, the total budget allocation for the programme was €7 million in 2011 and €14.7 million in 2012. The budget for evaluation of the project proposals was €700,000 in 2012. The funding is split between three priority areas: post-harvest and agriculture, sustainable energy, water and sanitation. In 2011 nine projects were awarded (€500,000-€750,000 per proposal, with grants covering 50-80% of the total costs). Scientists constructed consortia of at least three organisations from at least two different African countries (South Africa excluded). Established research networks and regional bodies recognised by the African Union Council such as Regional Economic Communities, are considered to be partnerships in themselves and did not need to form alliances with other organisations.

Alliance for a Green Revolution in Africa (AGRA, agra-alliance.org) is a public-private partnership for improving smallholder farming. AGRA’s works in Africa with a presence in 17 African countries.
AGRA was founded in 2006 through a partnership between the Rockefeller Foundation and the Bill & Melinda Gates Foundation; today it also receives funding from other governments, agencies and international institutions. AGRA had facilitated the **training of African scientists** at the MSc and PhD levels and **smallholder farmers** in modern agronomy, the **development of operated seed companies** and empowered agricultural entrepreneurs who are now providing small-scale farmers with better access to modern agricultural inputs, such as fertilizer and higher yielding, disease- and pest-resistant crop varieties. **African Enterprise Challenge Fund** (longterm multi-donor funding platform hosted by AGRA) pool of funds from donors to engage private sector in delivering public goods. Companies submit tenders and share the cost. **GAIN - Global Alliance for Improved Nutrition**, started off as trust fund. Now always combines private sector, national governments, academia and CSO. Business Platform for Nutrition Research, working with academia on pre-competitive research to address gaps in global evidence base on good nutrition, and barriers to entry for new products.

**ERAfrica** (European Research Area Network for Africa - Developing African-European joint collaboration for Science and Technology) facilitates the **networking of European and African research donors and encourages joint calls for proposals to promote long-term cooperation between EU Member States and /or associated countries and African countries (there are also ERA-Nets with Russia, India and Korea).** ERAfrica operates **within the framework of the Joint Africa-EU Strategy** (8th partnership) with the EC acting as catalyst (2 M€ funding under FP7; project from Dec 2010 to Nov 2014). 10 European (France, Germany, Portugal, Finland, Austria, Belgium, Spain, Switzerland, Norway, and the Netherlands), Turkey and 5 African (South Africa, Egypt, Kenya, Burkina Faso, Ivory Coast) countries are participating. **ERAfrica** provides the opportunity to **define jointly the priorities** and fields in which countries **decide to collectively invest**. All parties participate in the **decision-making on an equal basis**, irrespective of the amount of their financial contribution. First joint call (January 2013) for three types of cooperative activities: **research, innovation and capacity building**. Three thematic fields were defined: renewable energies, interfacing challenges (challenges of common interest) and “new ideas”. Each project had to involve at least four countries, two European and two African. Budget of 10 M€, of which the five participating African countries alone contributed almost half of the total funds. Although European financing of the programme ends at the end of 2014, the partners have demonstrated a shared desire to further pursue project implementation.

National research programmes in **Europe** are often run in an isolated way, leading to unwanted fragmentation or ineffectiveness. The **Joint Programming Initiative (JPI)** concept was recently introduced by the EC “to tackle common European challenges more effectively, in a few key areas, by **concerted and joint planning, implementation and evaluation of research programmes**”. Around 10 JPIs have been launched not following the same model on programming and funding but with tendency to follow same rules in the future. In general, each country contributes with variable funding and the EC confounds part through ERA-NET Cofund (funding tool, around 33% of call costs and other activities provided some rules are followed e.g. coherence with H2020) and other EC funding. The JPI also contribute to the identification of priority topics for H2020. Three JPIs are related to STI on agriculture and nutrition; participants are all European but may include **international partners as well** (South Africa in JPI-Water, Canada and New Zealand in JPI-HDHL).

- **FACCE-JPI** (JPI on Agriculture, Food Security and Climate Change) addresses the need to build more resilient food systems in the light of expected (and unexpected) changes ahead. It was in part a response to the 2007-2008 world food crisis and extreme climate events, such as the summer heat of 2003 and the spring drought of 2007 in Europe. Additionally, to
determine agriculture and forestry sectors potential for CC mitigation, reducing GHGs emissions and carbon sequestration. Agriculture also has to meet the estimated rise of food demand. Two calls already: BiodivERsA/FACCE call for research projects on «Promoting synergies and reducing trade-offs between food supply, biodiversity and ecosystem services» (8-10 research; total funding 9.7 M€ approx.; multistakeholder, including private); and, FACCE ERA-NET+ action “Climate Smart Agriculture: Adaptation of agricultural systems in Europe” co-funded by FP7 (11 projects; total 18.7 M€ from 22 national funding organizations from 18 countries, and the European Commission).

- **JPI-Water** deals with research in the field of water and hydrological sciences and responds to the grand challenge of “Achieving Sustainable Water Systems for a Sustainable Economy in Europe and Abroad”. Water in agriculture is a major component. **Participation of 18** countries including **South Africa**. Call may include additional funds in the form of loans from countries to private partners (SMEs). Third call (2015) on “improving water use efficiency and reducing soil and water pollution for a sustainable agriculture”. A Horizon 2020 on an ERA-NET has been published through Societal Challenge 5. The Strategic Research and Innovation Agenda of the Water JPI (presentation on 21st October 2014) provides a framework for future Research, Development and Innovation activities and European investments in the water sector (over 500 M€ per year) laying out needs grouped by thematic areas and priorities according to their scientific and societal importance.

- **JPI HDHL** (Joint Programming Initiative A Healthy Diet for a Healthy Life) following the vision: “By 2030 all Europeans will have the motivation, ability and opportunity to consume a healthy diet from a variety of foods and have healthy levels of physical activity, and that the incidence of diet-related diseases will have decreased significantly.” The JPI HDHL aims to coordinate research on the impact of diet and lifestyles on health, significantly contributing to the construction of a fully operational European Research Area for the prevention of diet-related diseases and strengthening the leadership and competitiveness of research activities in this field. 25 Member States and Associated Countries are engaged. Only Canada and New Zealand are non-European participants. The first joint action “DEDIPAC - the Knowledge Hub on the Determinants of Diet and Physical Activity” was launched on November 2012: 56 research groups including 160 scientists from 12 JPI Member States were selected to carry out a programme of joint trans- and multidisciplinary activities. On April 2014, the JPI HDHL launched a transnational call for research proposals on Biomarkers in Nutrition and Health (BioNH).

The **European & Developing Countries Clinical Trials Partnership (EDCTP)** aims to accelerate the development of new or improved drugs, vaccines, microbicides and diagnostics against HIV/AIDS, tuberculosis and malaria, with focus on phase II and III clinical trials in sub-Saharan Africa. It started in 2003, jointly funded by EC and 16 member states. Second-phase (EDCTP Association) will allow for co-funding from African countries. South Africa, Congo Brazzaville, Senegal, Cameroon and Uganda have already committed to 200,000 euros. Congo, Zambia, Mozambique, Burkina Faso, Gambia and Tanzania have marked a strong interest to join in the future. The EU will provide a maximum Union financial contribution of 683 million euro on condition that it will be matched by at least the same amount from the participating European countries. In the EDCTP2 Strategic Business Plan the participating European countries provide 1.6 billion euro upfront commitments for 2014 to 2023. Funded activities are based on: Supporting relevant clinical trials; Networking and coordination of European national research and development programmes and with their partners in the south; Networking and coordination of African national programmes; Strengthening African capacity in this field.
The European Innovation Partnership for Agricultural productivity and Sustainability (EIP-AGRI) was launched in 2012, works to foster competitive and sustainable farming and forestry that ‘achieves more and better from less’. It contributes to ensuring a steady supply of food, feed and biomaterials, developing its work in harmony with the essential natural resources on which farming depends. The EIP-AGRI follows an interactive innovation model which brings together specific actors (e.g. farmers, advisors, researchers, businesses, etc) to work together in multi-actor projects (Operational Groups) in order to find a solution for a specific issue or developing a concrete opportunity. A high-level steering board has kicked off the EIP-AGRI by providing strategic orientations for its implementation. Coordinating agricultural research across the European Research Area, the Standing Committee for Agricultural Research, which consists of representatives from Member States and Candidate and Associated Countries, has engaged in assisting the EIP through the development of innovative Horizon 2020 instruments. It is providing advice via a dedicated working group on Agricultural Knowledge and Innovation Systems (AKIS). Different types of available funding sources can help get an agricultural innovation project started, such as the European Rural Development policy or the EU’s research and innovation programme Horizon 2020. The EIP-AGRI contributes to integrating different funding streams so that they contribute together to a same goal and duplicate results. Rural Development will in particular support Operational Groups and Innovation Support Services within a country or region. Horizon 2020 will fund multi-actor projects and thematic networks involving partners from at least three EU countries. Other policies may offer additional opportunities. The EIP-AGRI website has interactive useful features, including funding opportunities for innovation projects, potential partners, innovative project ideas and practices, information about research and innovation projects, including projects’ results. EIP-AGRI Focus Groups are temporary groups of selected experts focusing on a specific subject, sharing knowledge and experience. The Focus Groups organized until now are: Animal husbandry; Fertiliser efficiency; Genetic resources; High nature value; IPM for Brassica; Organic farming; Permanent grassland; Precision farming; Protein crops; Soil organic matter.

CAAST-Net Plus (www.caast-net-plus.org/) is a network of 25 partner organizations from all over Europe (Austria, Germany, Switzerland, Portugal, France, Greece, Spain, Norway, Finland) and sub-Saharan Africa (Cape Verde, South Africa, Rwanda, Kenya, Senegal, Madagascar, Malawi, Ghana, Nigeria, Uganda). Also includes Egypt, the Association of African Universities and the Association of Commonwealth Universities. CAAST-Net Plus is funded by the EU FP7 and it builds on the activities and outputs of the CAAST-Net project (2008-2012). CAAST-Net Plus will run from 2013 to 2016 and will make contributions to the quality and scope of the Africa-Europe STI relationship for mutual benefit. The objectives are:

- To encourage new and diverse multi-stakeholder partnerships that, through research and innovation, tackle the global challenges of health, food security, and climate change that affect Europe and Africa;
- To enable better understanding between the public and private sector in Africa and Europe of the link between research and innovation, and to identify and share opportunities for cooperation through networking and communication;
- To facilitate exchanges that result in learning and that support formal policy dialogue for more effective research and innovation cooperation.

PAERIP (Promoting African European Research Infrastructure Partnerships) is a project funded under FP7 (Theme INFRA-2010-3.2). The project will create a dedicated initiative to promote research infrastructure partnerships between Europe and Africa. Four African and four European partners. An
inventory of Research Infrastructures in Europe and Africa is available on-line (inventory.paerip.org/paerip/). In May 2012 it was carried out a PAERIP survey to look at how to improve collaboration between European and African researchers, explore the experiences of European researchers in their participation in African research infrastructures, and to identify major factors hindering research collaboration between both continents, and to find solutions on ways to improve and increase European participation in African research projects. Duration: April 2011- April 2013. Project budget: €450000.

The JOlISAA (Joint learning in and about Innovation Systems in African Agriculture) is a project funded under EU FP7 and operated from February 2010 to July 2013 with the aim to increase understanding of agricultural innovation systems focusing on smallholders’ livelihoods and the articulation of local and global knowledge. The goal was to assess how smallholders’ innovativeness, knowledge, capacities and other resources can be tapped into, strengthened and linked effectively to those of other stakeholders – public or private, local or global – to contribute to reducing rural poverty and improving food security in Africa. Lessons learnt about recent experiences with agricultural/rural innovation involving multiple stakeholders in Kenya, South Africa and Benin have been synthesised by combining joint case-study assessment with capacity-strengthening and networking at various scales. It had three African and four European partners.

INSARD (Including Smallholders in Agricultural Research for Development) Project is working towards making it easier for NGOs and farmer organisations to be actively involved in influencing agricultural research systems in Africa. The research needs to involve these organisations at all stages: in determining needs, identifying problems and opportunities, designing and testing new possibilities, sharing results, and assessing the way the research is done and the results shared. Incorporating smallholders into ARD in this way will help to better serve their needs and to discover and spread innovations that farmers have been involved in developing. www.etc-international.org/portfolio/insard/

Joint Undertaking Bio-Based Industries ) is an integrated and fundamental tool under Horizon 2020 to realise the biobased industry vision. The Joint Undertaking focuses on developing EU-based value chain (fbheuropabiovideos.co.uk/BBE_PPP/about). The PPP is an instrument to support industrial research and innovation, to overcome the innovation ‘valley of death’, the path from research to the marketplace. It encourages partnership with the private sector to fund and bring together the resources needed to address the challenges involved in commercializing major society-changing new technologies.

TEMPUS is the European Union’s programme which supports the modernisation of higher education in the EU's surrounding area. Tempus promotes institutional cooperation that involves the European Union and Partner Countries and focuses on the reform and modernisation of higher education systems in the Partner Countries of Eastern Europe, Central Asia, the Western Balkans and the Mediterranean region. The Tempus programme is implemented in close coordination with the Erasmus Mundus programme which provides scholarships to third country students allowing them to participate in top-level Master courses and Doctorate programmes outside the EU. The ENPI (European Neighbourhood and Partnership Instrument) provides financial support for the European Neighbourhood Policy and ENP countries plus Russia.

AGRINATURA Project is the European Alliance on Agricultural Knowledge for Development, a new entity established jointly by 31 European research and education organisations (www.agrinatura.eu)
working in agricultural research, education, training and capacity strengthening for development. AGRINATURA formulates and implements research and education programmes and projects in developing and emerging economy countries on every continent. AGRINATURA’S actions in the field of education are two-fold: A) Develop an integrated offer of capacity building in Europe in agriculture for development and integrated management of natural resources; B) Support and strengthen the capacities to build capacities in the South, through various partnerships and projects. AGRINATURA works in partnership with the European Commission on A) Strategy analysis on the Use Biotechnologies in Developing Countries, and B) Monitoring of EC funded CGIAR projects; and with the European Initiative on Agricultural Research for Development (EIARD) on Policy and strategic support on key ARD topics.

The objective of the European Information System on Agricultural Research for Development (EARD-InfoSys+) is to map the European landscape of Agricultural Research for Development (ARD). It is collecting metadata on organisations, projects, funding opportunities, experts, news and events in European ARD. All the information is available online through a relational database which can be searched by theme, country, organisation, project, geographical focus, funding type, etc...


The BMBF is taking a radical new approach. It aims to help African regions worst affected by climate change to set up appropriate scientific structures so that the countries in these areas are able to make their own valid decisions – for example, with regard to their land use and water supply. However, the funding is not charitable development aid, but an investment from which the BMBF expects to generate valuable knowledge in the fight against climate change. It is also about building and maintaining trusting partnerships with the countries involved, above and beyond the research collaboration. The initiative is based on the belief that regional problems can only be solved with the help of regional research. Total funding is up to 100 Mill. EUROS.

WASCAL: After intensive negotiations, a cooperation agreement was signed on February 10, 2012 in Lomé, the capital of Togo, by Dr. Georg Schütte, State Secretary in the Federal Ministry of Education and Research, and ten African countries: Benin, Burkina Faso, Gambia, Ghana, Ivory Coast, Mali, Niger, Nigeria, Senegal and Togo. The agreement confirmed the construction of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) and guaranteed funding for a minimum of five years. A new campus with laboratories and lecture theatres will be created in Ouagadougou, Burkina Faso, while the headquarters and administrative seat of WASCAL will be located in Accra, Ghana. Research findings from all of the participating countries will be collated in the climate competence centre in Ouagadougou. Every country has a programme for doctoral students that deals with a specific aspect, such as “Climate change and water (use)” in Benin and “Biodiversity” in Ivory Coast. The African governments have committed themselves to bearing shares of the running costs from August 2012. This proportion will increase from around five percent per year initially to twenty percent in 2016. The Federal Ministry of Education and Research is only shouldering the cost of the start-up funding in its entirety. The decisions about which research projects WASCAL will tackle in practical terms are in the hands of the Africans themselves. Scientists
from the region together with their German counterparts have started a research programme examining the direct impact of climate change, like rainfall distribution and desertification, they will also look at the indirect effects, such as food supply, migration and security policy aspects.

SASSCAL: is a joint initiative of Angola, Botswana, Namibia, South Africa, Zambia, and Germany, responding to the challenges of global change. The establishment of a Southern African Science Service Centre for Climate Change and Adaptive Land Management could create added value for the whole southern African region. It should be conceptualised and operationalised to complement the excellent existing research and capacity development infrastructures and research initiatives in the region. It should be embedded in the regional and national research. Its mission is to conduct problem-oriented research in the area of adaptation to climate and change and sustainable land management and provide evidence-based advice for all decision-makers and stakeholders to improve the livelihoods of people in the region and to contribute to the creation of an African knowledge-based society.

**Green Innovation Centers in Cooperation with Africa.** Initiative by German Government (Ministry of Economic Cooperation and Development) to facilitate value chain oriented innovation Centers / platforms in cooperation with 12 African Countries.

Funding up to 100 Mill. EURO for 2014-2016


**GlobE – Research for the global food supply**


The new German Governments (BMBF) funding initiative “Securing the Global Food Supply – GlobE” takes a systemic and interdisciplinary approach - a situation analysis will be carried out, a research question formulated and then solved in cooperation with local partners. The funding initiative will include research projects that are tailored to local circumstances and which the regional partners in Africa consider to be necessary and sustainable. The initiative is open to all technologies and will support both existing networks and the establishment of new partnerships.

German institutions applied for BMBF project funding together with African partners. The existing instruments of the Federal Ministry for Economic Cooperation and Development will continue to be available on a supplementary basis for the international agricultural research centres within the CGIAR. In this way, new and existing Federal Government activities in the area of global food supply are being linked in an optimal way and made more transparent and efficient for German and international partners alike. The initiative GlobE is divided into two funding phases. During the first half of 2012, in the first phase, the preparation of 15 research concepts was funded. Of these, six were selected for the second funding phase, which began in April 2013. In this second phase, six research collaborations are being financed for between three and five years. For the maximum duration of funding of up to five years the BMBF will invest up to 45 Mio. € (including a financial contribution from the Federal Ministry for Economic Cooperation and Development).

**UK Research Clubs**: A group of companies interested in similar pre-competitive research questions ‘club’ together putting in equal amounts of funding, which is matched by public funders. Then this is made into a research call, which the academic community responds to. There are regular
dissemination meetings with the grant-holders and the private sector throughout the duration of the grant to show what the research has established/produced. ([http://www.bbsrc.ac.uk/business/collaborative-research/industry-clubs/crop/crop-index.aspx](http://www.bbsrc.ac.uk/business/collaborative-research/industry-clubs/crop/crop-index.aspx))

**Sandpit / Ideas Lab model** is a really innovative approach to research funding in UK. The competitive stage of this programme is to be selected for a week long, intense event on a particular theme e.g. enhancing photosynthesis efficiency. Ultimately around 15-20 researchers from a range of research disciplines are chosen. Over the week they group themselves and iteratively develop research proposals with each other, assisted by on-site mentors. At the end of the week they present their proposals to a peer review panel. Previously these initiatives have been co-funded between the UK and another country e.g. the US. The idea is to develop a research proposal that will bring about a step change in how that topic is researched. ([http://www.epsrc.ac.uk/files/funding/calls/2014/sandpitwaterenergyfoodnexus/](http://www.epsrc.ac.uk/files/funding/calls/2014/sandpitwaterenergyfoodnexus/))

**Combating Infectious Diseases in Livestock for International Development (CIDLID)** is a collaborative research programme with 3-4 member research teams, from both UK and Africa (or other international expertise) for a duration of 3-4 years. In CIDLID, the UK side was funded by the Research Council, and international collaborators by the Department for International Development. Programmes are assessed on scientific excellence. It would be good for this to evolve into a programme more like ERAfrica, where each country is able to fund its own researchers for a greater sense of co-ownership and greater long term sustainability. ([http://www.bbsrc.ac.uk/funding/opportunities/2008/combating-infectious-diseases-livestock.aspx](http://www.bbsrc.ac.uk/funding/opportunities/2008/combating-infectious-diseases-livestock.aspx))

The **Intra-ACP academic mobility scheme** supports higher education cooperation between countries in Africa, the Caribbean and the Pacific (ACP) and aims at increasing the availability of trained and qualified high-level professional manpower in the ACP countries. The Education, Audiovisual and Culture Executive Agency is responsible for the managing this programme, with the support of the African Union (AU) and the Africa Caribbean and Pacific Group of States (ACP), and under the supervision of the Directorate-General for Development and Cooperation-EuropeAid. It provides support to: a) higher education institutions to set up inter-institutional cooperation partnerships between universities from different countries within the ACP regions; b) individual students, researchers and university staff to spend a study / research / teaching period in the context of one of the above mentioned cooperation partnerships; This programme builds on the African Union’s Mwalimu Nyerere programme for Africa.

Forum International sur la promotion des innovations et des partenariats dans le secteur agro-alimentaire et des agro-ressources (FINNOVAR). The 1st FINNOVAR was organized in Dakar (2010 et 2011), 2nd in Kinshasa (2012) and 3rd in Dakar (2014), the last one organized by the Institut de Technologie Alimentaire (ITA), l’Institut Sénégalais de Recherches Agricoles(ISRA), the Délégation Wallonie Bruxelles à Dakar and CIRAD.

Over a 20-year period, the Sasakawa Global 2000 partnership has sponsored country technology transfer projects in 15 African countries. In assisting with implementation of the CAADP initiative, it has formed viable partnerships with the CGIAR Centers and the NARS.

**Poverty Alleviation Programme** has economic and social interventions that are linked to IDP and growth Strategy of eThekwini Municipality (South Africa), including co-operatives development and
support but it does not have research or innovation
(http://www.durban.gov.za/City_Services/Community_Participation/Pages/Poverty-Alleviation-Programme.aspx)

**Intercontinental Bureau for Animal Resources (AU-IBAR)** provides leadership in the development of animal resources for Africa. AU-IBAR’s mandate covers all aspects of animal resources, including livestock, fisheries and wildlife, across the entire African continent. The specific areas of the mandate include to improve public and animal health through the control and possible eradication of transboundary animal diseases and zoonoses; to improve the management of animal resources and the natural resource bases on which they depend; to explore investment options and enhance competitiveness of African animal products; to contribute to the development of relevant standards and regulations and enhance compliance by Member States; to strengthen institutional capacity and support policy development and harmonization; and others related activities.

**CGIAR Research Programs (CRPs of the CGIAR)** tackle cross-cutting issues in agricultural development across the globe, with the intention to align the research of the 15 CGIAR Research Centers, and some of their partners, into efficient, coherent, multidisciplinary programs. Although some progress has been made towards this goal and some complementarities have been achieved, there are still tendencies to duplicate efforts as well as difficulties for the CRPs to involve the NARS (from Africa and from Europe). Competition for Human Resources between the CGIAR Centers and the African NARS, also need to be more properly addressed. Sixteen CRPs have been prepared and reviewed in a transparent way and considering relevant stakeholders. Current CRPs on (http://www.cgiar.org/our-research/cgiar-research-programs/):

1. Dryland Cereals;
2. Grain Legumes;
3. Livestock and Fish;
4. Maize;
5. Rice;
6. Roots, Tubers and Bananas; and
7. Wheat.
8. Climate Change, Agriculture and Food Security;
9. Forests, Trees and Agroforestry; and
11. Integrated Systems for the Humid Tropics;
12. Aquatic Agricultural Systems; and
15. Agriculture for Nutrition and Health.

Partners also include European, American, Asian and other international institutions. The CGIAR Fund provides reliable and predictable multi-year funding to enable research planning over the long term, resource allocation based on agreed priorities. The multi-donor trust fund finances research carried out by the Centers through the CGIAR Research Programs (EC is a major donor. Other funders include IFAD, BMGF,ACIAR, USDA...).

The **Agricultural Science and Technology Indicators (ASTI, www.asti.cgiar.org)** initiative, led by the International Food Policy Research Institute (IFPRI), is a comprehensive and trusted source of information on agricultural research and development (R&D) systems across the developing world. Working with a large network of country-level collaborators, ASTI conducts primary surveys to
collect data from government, higher education, nonprofit, and private agricultural R&D agencies. After analyzing the resulting raw data, ASTI publishes quantitative and qualitative information and trends on funding sources, spending levels and allocations, and human resource capacities, at both country and regional levels. Funded by Bill & Melinda Gates Foundation, Government of Canada (DFATD), USDA and others.

Innovations for Poverty Action (www.poverty-action.org) was born in 2002 when Dean Karlan founded Development Innovations, a non-profit organization dedicated to bridging the gap between academia and development policy in practice. MIT’s Poverty Action Lab (now the Abdul Lateef Jameel Poverty Action Lab, or J-PAL), a center at MIT and network of like-minded researchers from around the world, started in 2003. From the beginning the two organizations were set to work closely. Today over 250 researchers — many professors at some of the leading institutions of higher education in the world — turn to IPA to implement and manage their projects.

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), established in 2004, is a consortium of 46 African universities operating within 22 countries spanning the African continent. RUFORUM is coordinated by a Secretariat hosted by Makerere University in Kampala, Uganda. RUFORUM is registered as NGO and has mandate to oversee graduate training and networks of specialization in the Common Market for Eastern and Southern Africa. In July, 2014, RUFORUM signed a cooperation agreement with the African Union to support the implementation of the new African Union for Science, Technology and Innovation Strategy for Africa, 2024 (STISA 2024). RUFORUM allows for joint action by the member universities; this is enhanced through joint faculty appointment for the 46 universities, payment of local fees by graduate students and national mechanisms (National Forums) which ensure wide stakeholder participation in the RUFORUM programmes. The consortium provides a wide array of training opportunities for stakeholders, and is in the process of establishing credit transfer mechanisms among the member universities.