



A Network for the Coordination and Advancement of Sub-Saharan Africa-EU Science and Technology Cooperation

**CAAST-Net Stakeholder conference paper on
Innovation to support the bi-regional
STI dialogue between Africa and Europe**

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1. Setting the scenario and context for the CAAST-Net conference

The Science and Technology cooperation between the African Union (AU) and the European Union (EU) is based on a framework that relies on established political dialogue and policies. This political relationship and the strategy for cooperation between the two regions are outlined in different bi-regional strategic documents, and primarily the [Joint Africa-EU Strategy \(JAES\)](#)¹ adopted in 2007. The JAES defines 8 areas for strategic partnership, including the 8th Africa-EU Partnership on Science, Information Society and Space. The objectives and priorities set by these political partnerships are implemented through successive Action Plans which define the Priority Actions for each partnership. The Priority Actions of the 8th Partnership are to Support S&T Capacity Building for the implementation of Africa's Science and Technology Consolidated Plan of Action; to support the development of an inclusive information society in Africa; and to enhance cooperation on space application and technology. To address some of these Priority Actions, 19 specific initiatives are identified in the http://www.africa-eu-partnership.org/sites/default/files/090515_p8lighthouse.pdf³.

The European Commission Resources:

The European Union supports research and development activities primarily through the Framework Programmes (FPs), which are proposed by the European Commission and adopted by the Council and the European Parliament. FPs have been implemented since 1984 and cover a period of five years, with the last year of one FP and the first year of the following FP overlapping. The current FP is http://cordis.europa.eu/fp7/home_en.html, ends in 2013 and will be replaced by [Horizon 2020](#)⁴.

The African Union Resources:

The bi-regional strategic documents that define the Science and Technology cooperation between Africa and Europe acknowledge the African regional policy documents, such as [Africa's Science and Technology Consolidated Plan of Action \(CPA\)](#) that was developed in 2005 by the African Union through the [African Ministerial Council on Science and Technology \(AMCOST\)](#). The CPA identifies the regional priorities and needs for research and cooperation, consolidating the science and technology programmes of the AU Commission (AUC) and the AU programme [The New Partnership for Africa's Development \(NEPAD\)](#). The most important AU resource for the science cooperation between Africa and Europe is the [African Union Research Grant Programme](#).

The CAAST-Net Project

[CAAST-Net](#) or the Network for the Coordination and Advancement of sub-Saharan Africa-EU Science & Technology Cooperation aims to increase the quality and quantity of bi-regional cooperation in science and technology between Europe and Africa,

¹ Joint Africa-EU-Strategy (JAES), 2007, <http://www.eeas.europa.eu>, <http://www.europafrica.net/jointstrategy>

² Book of Lighthouse Projects,

³ Book of Lighthouse Projects,

⁴ <http://www.ec.europa.eu/horizon2020>

targeting areas of mutual interest and benefit. It is a five-year joint Africa-Europe platform created under the INCO Programme in the Capacities Programme in FP7 (2007-2013) and started in January 2008. This INCO-Net is dedicated to advancing bi-regional (African / European) cooperation in science and technology.

Cooperation between Europe and Africa in the field of science and technology, with its long and multifaceted history, is one of the pillars supporting the increasingly diverse relationship between our two continents and is a strand running both explicitly and implicitly through the joint strategy and its first action plan.

Against the background of a global consensus that indigenous capacity in science and technology is an essential pre-requisite to economic competitiveness, sustainable development and poverty reduction, the Network for the Coordination and Advancement of sub-Saharan Africa-EU Science & Technology Cooperation (CAAST-Net) has been developed as a high-level platform, financed by the European Union's Seventh Framework Programme (FP7), to advance international cooperation between Europe and Africa for mutual benefit.

CAAST-Net's goal is an increase in the quality and quantity of bi-regional cooperation in science and technology between Europe and Africa, targeting areas of mutual interest and benefit through greater use of instruments under the FP7, as well as through other instruments of international cooperation, and through lobbying for greater synergy between R&D and development instruments.

In support of its goal, CAAST-Net has a range of activity clusters with the aim to:

- supporting and informing existing Europe-Africa S&T policy dialogue and cooperation processes.
- identifying and prioritising common research areas of mutual interest and benefit, especially for inclusion in the thematic priorities of the FP7 Cooperation Programme, harnessing cooperation to address specific problems faced locally and regionally within Africa, as well as common problems of a global nature.
- promoting synergy between Europe-Africa S&T partnerships and development cooperation instruments in order to enhance the creation and application of new knowledge in support of achieving the MDGs, poverty alleviation and economic growth.
- undertaking specific activities dedicated to strengthening of the participation of African countries in the Framework Programme through a series of events aimed at raising awareness, providing information, brokering partnerships and optimising synergies.
- monitoring the performance and impact of Europe-Africa S&T cooperation under the Framework Programme to inform future cooperation policy.

CAAST-Net Steps to Innovation Policy Document

Taking cognizance of the need to promote innovation under the bi-regional cooperation as a means of fostering development, CAAST-Net initiated and organized an Innovation conference in Dakar, Senegal in April 2012, with the aim of developing a policy advice document that could be offered to the AUC-EU policy dialogue.

Background on the Innovation Conference

The 2007 Joint Africa-EU Strategy formalised a new Africa-Europe political relationship and recognised the mutual interest and benefit arising from bi-regional cooperation based on equitable partnerships for addressing global and developmental challenges.

Set against the background of a global consensus on the vital contributions of scientific and technological research, development and innovation to addressing global challenges, and of the common policy goals of increasing investment in S&T capacity, the two continents are forging an ever closer relationship in scientific and technological R&D, addressing issues of common interest. Innovation therefore ranks very high on the policy agenda in both Europe and Africa.

Innovation policies and systems are key to the translation of R&D outputs into novel technologies, goods and services, but innovation is also seen as a major driver of economic growth and therefore as a significant determinant of emergence from the global recession. In 2011, the first senior officials meeting of the Africa-EU-Policy Dialogue on STI in Addis Ababa highlighted the role of innovation both for fostering the knowledge base of societies and economies and for addressing global societal challenges. In the specific context of bi-regional S&T cooperation partnerships for addressing global societal challenges, the role of innovation has until recently, received relatively little attention.

The Dakar conference provided the opportunity to enrich and strengthen the Africa-Europe STI cooperation relationship through exchange of opinions, sharing and mutual learning between stakeholders and experts from Africa and Europe. It leveraged on the topics of the 2009 Coordinated Call for Africa2 as the conference theme and drew on practical examples of past and on-going S&T bi-regional cooperation initiatives as case studies. The conference explored a range of issues related to the role of innovation systems and policies in the context of bi-regional cooperation, with a view to enhancing the contributions of R&D to identifying solutions to global challenges.

One of the key deliverables of the conference is to formulate evidence of good practice in innovation process and policies for informing regional STI authorities and enriching the formal bi-regional STI policy dialogue.

2. Introduction and background to the Dakar conference

CAAST-Net's 2nd Stakeholders Conference 'Steps to Innovation', held on April 22-24, 2012 in Dakar, Senegal, was one of a series which has been conceived within the framework of Africa-Europe cooperation in ST, aiming at reinforcing the bi-regional partnership by encouraging discussion amongst stakeholders on issues of key importance to the partnership and its priority objectives. This second conference focused on scientific and technological innovation as a driver of socio-economic development, through the translation of knowledge into good and services. This conference report draws on the plenary presentations and discussions, additional materials available at the conference, and on the four parallel workshops. The report summarises issues considered important by stakeholders of the bi-regional STI partnership and presents some of their recommendations. Both the conference and this report are potential contributions from the stakeholder community to formal, institutional bi-regional dialogue on the same topic.

Plenary presentations, debates and parallel workshops were guided by a series of questions, formulated by the CAAST-Net project:

- Where are the gaps and needs?
- What are good practice examples?
- What potential for bi-regional cooperation could be identified?
- What expectations should be addressed to R&D policy on bi-regional cooperation?
- What structures for technology transfer should be followed up?

The body of this report is structured around the four parallel workshops:

- Promoting Industry-Academia Relationship and Entrepreneurship
- Valorising different Sources of Knowledge and Innovations
- Protecting Knowledge and Innovations
- Securing financing to foster Innovation Processes

The conference, through stakeholder discussions, sought to draw out broad principles and ideas about innovation in the framework of the priorities of Africa-Europe S&T cooperation with a view to reinforcing the bi-regional partnership and its socio-economic development outcomes.

Africa and Europe have shared interest in addressing societal challenges. Addressing these challenges require effective global networks and partnerships. Implicit to the conference's purpose was the advancement of mutual learning and understanding of the Africa-EU bi-regional partnership to promote innovation for socio-economic development based on cross-borders innovation clusters and networks that have local relevance, importance and acceptance, but also global impact and contribution to the solution of societal challenges.

Research and development (R&D) have an important role to play in the socio-economic development of all nations, but to play this role the outputs of R&D have to be translated into socio-economic development, implying that they have to be applied, deployed and/or commercialized. This is the process of innovation⁵.

Innovation systems are complex and dynamic. For meaningful outcomes, discussion of innovation rooted in bi-regional cooperation should optimally consider the perspectives of innovation system actors across the multiple sectors of relevance to the cooperation partnership (e.g. water and energy access, food security, environmental sustainability) with broad-based recommendations taking an integrative approach.

STI policy for Africa-EU cooperation must be integral to national innovation system (NIS) policies. Some of the prerequisites for NIS are:

- To promote public and private investments in the innovation process,
- To increase the involvement of industry,
- Discrimination in the selection of innovation activities and related priorities.

A NIS emerges and is sustainable in an environment based on sound educational, technical, social, financial, legal and institutional systems that are supportive of STI capacity building and economic growth.

An innovation strategy has to consider the following aspects:

- The globalisation of knowledge production and of innovation capacities
- The need for survival of innovative SME's and VSE's
- The major societal challenges that have to be addressed

For the implementation of innovation and innovation strategy there is a need for an innovation system that is viewed as a systematic process. This implies:

- improving the institutional capacities (coordinating structures)
- improving the institutional capacities (partnerships)
- a dual effort in addressing national challenges as well as raising global challenges of mutual interest
- supporting the demand and supply of innovation
- enabling global frameworks (clusters, networks)
- motivating to engage in international cooperation
- promoting the participation of industry (national and multinational) and other important players (such as foundations, banks, international agencies, etc.)
- supporting also the informal aspect of the economies based on innovative SME's and VSE's

⁵ A summary of the definitions of innovation from NEPAD's perspective can be found in: 'AU-NEPAD (African Union-New Partnership for Africa's Development) (2010), African Innovation Outlook 2010, AU-NEPAD, Pretoria. ISBN: 978-1-920550-45-5'.

Considering that innovation is not only research, it is imperative to recognize that a very critical factor in the innovation process is the deployment (including commercialization) of knowledge and R&D results to contribute and guarantee the targeted socio-economic development. In this innovation process chain there are at least four key process elements to be addressed:

- Industry-Academia Relationships and Entrepreneurship
- Sources of Knowledge and Innovation
- Protection of Knowledge and Innovation
- Financing to foster the Innovation Processes

3. Industry-Academia Collaboration

There is a need to clearly identify and define what is meant by 'Industry' and 'SME's' in the context of a bi-regional Africa-EU cooperation. These terms may have different meanings and understandings on both sides. In Africa the informal economy, based on very small SME's is an important sector. There is a lack of framework to address innovation for this important segment of the economy. Local universities have almost no level of relationship to, or interest in the informal sector of the economy.

Independent from the clarification of terms, there is a strong need for management structures to emerge and drive cooperation between academia and industry (all segments and types). They may be called 'interfacing institutions' and bring the key actors in the innovation process together, especially academia (research institutions and universities) and industry to ensure that knowledge and research results needed for the innovation process and coming from academia get to the marketplace or to the points of usage. Different concepts and models of interfacing institutions were presented and discussed at the conference:

(a) In the model of Nano Consulting Ltd (UK)⁶ a facilitator and project manager links industry to academia. This function could be provided by, for example, an industry-facing R&D consultancy with close links to academia. In the example presented at the conference interfacing is provided by a not-for-profit company, owned by academic institutions, that supports the building of a spin-out mentality in academic institutions and helps in attracting additional (non-governmental) funds in having access to up-to-date equipment and infrastructures, in improving employment prospects for academic staff and students, and in supplementing income to professors and researchers in the academic institutions.

(b) In the model of the Fraunhofer Centre for Socio-Economic Development, ICT 4D (Portugal)⁷, an interdisciplinary, international team of experts (partially from

⁶ Model of Nano Consulting Ltd. (UK), <http://www.bio-nano-consulting.com>

⁷ Model of the Fraunhofer ICT 4D (Portugal), http://www.fraunhofer.pt/en/fraunhofer_aicos/research_areas/activity_areas/ict4d.html

academic institutions) joins forces in a Competence Centre (e.g. ICT 4D) endorsed by several national and international research and funding agencies (e.g. World Bank, UNCTAD, BMZ/GIZ(D), Fraunhofer). It is also endorsed by multinationals and local companies, as well as universities. The example the Competence Centre presented at the conference is customer-driven, with target customers being African and European companies and organizations such as mobile-network operators, trade and industry organizations (representing SME's and VSE's) and governments. The Competence Centre acts as a bridge between Africa and Europe by e.g. facilitating temporary exchange of researchers and experts (as needed in the projects), promoting opportunities in European to African companies and vice-versa and supporting a continuous and sustainable innovation process.

Stakeholders expressed the need for more documented case studies and proven successful industry-academia collaborations in Africa and Europe. Such case studies could be used to promote and support the creation of such interfacing institutions to pro-actively develop better and more efficient industry-academia relationships. Other recommendations from the stakeholders participating in this working group include:

1.1. Sustainable networks and cluster initiatives

Creating sustainable networks was seen as an important need at the regional and global level. Mega-networks, cutting across regions, serve to facilitate collaboration between industry and academia. Such thematic, multi-regional networks serve to identify problems either unique to the region or that are a global challenge to Africa and Europe. They work together to facilitate research and innovation in such areas. These networks could also help in providing matching funds for innovation projects. They can also be implemented as cross-country networks and may allow for different speeds in socio-economic development, based on the differences and special characteristics of the countries involved.

Cluster initiatives were also seen as an important tool for fostering industry-academia collaboration in innovation. Cluster initiatives are established to address enterprises (especially SME's and VSE's) in a specific geographical area, pulling in many stakeholders and raising competitiveness of the institutions involved.

These sustainable networks and cluster initiatives can be developed based on the evolution from collaborative research and Living Labs to Innovation Platforms⁸, based on a two layer concept, a legal framework and a

⁸ Concept of the Innovation Platforms, <http://www.gris.informatik.tu-darmstadt.de/home/members/encarnacao/index.de.htm>

technology platform. They may be implemented as a public-private-partnership (ppp) model; a public limited model or other legal form, and have the target of enabling and facilitating deployment of R&D results coming from projects funded by national and international research programmes. This deployment (commercialization) contributes to the innovation process and is needed for the socio-economic development of the targeted region.

1.2. Policy and Strategy for Innovation

A policy and strategy for innovation was identified as a major need to facilitate and promote cooperation between industry and academia. At an institutional level, institutions should have internal strategies to add value to their own mission and research results. At the national level, the strategy should link universities to entrepreneurs, to SME's/VSE's and be beneficial to industry in general. At the regional level, a strategy for innovation should provide benefit to industry, academia and the region. Each of these strategies should be linked to the Joint Africa-EU Strategy and other important regional strategies and have dedicated funding mechanisms.

Working group participants stressed that such a policy and strategy for innovation should take the following into consideration:

- 'Industry' is a term that needs a more precise definition or specification (formal vs. informal; Large Enterprises vs. SME's / VSE's) to avoid ambiguities,
- Ideas for innovation come not only from universities, but for example from research centres/laboratories and from civil society.
- Innovation needs a multi- and interdisciplinary approach (user and market driven),
- Innovation should take advantage of the potential of youth,
- Innovation funding is NOT only research funding,
- Innovation needs management; therefore there is a strong need for human resources with specific skills in the management of innovation.

4. Valorising different sources of knowledge and innovation

The process of disseminating scientific publications is not sufficient for technology transfer. There is an additional need to guarantee flow of information to people who use and service a given innovation (technology). There is also a need to sufficiently train

people to use innovation, facilitate the deployment of innovation by companies and get academia involved in teaching innovation (e.g. technology, skills).

Valorisation of different sources of knowledge and innovation is guaranteed by adding value to them and this is achieved by making use of them and by translating them into goods and services that meet market demands. These demands have to take into consideration the different needs and characteristics of the formal and the informal sectors of the targeted economies.

Innovation in this context has to be seen as the capacity to manage change, to deploy research results and – in its implementation – to adapt to the social context and constraints. Innovation therefore has to be monitored and evaluated.

To facilitate valorisation, the lack of communication between the relevant stakeholders for a given innovation has to be avoided or overcome. A best-practice example presented in the working group is given by ‘Innovation Collaboratories’⁹ of the German Academy of Science and Engineering (acatech) with regional partners (local academies, industry, universities, etc.) for German cooperation with China and India. New Collaboratories of this kind are being planned and developed for Brazil and South Africa. The role of these Collaboratories is to:

- bring together all the stakeholders (local and international; industry and universities) that are needed for a given innovation initiative,
- get them involved in such an innovation initiative,
- bridge the communication gap between stakeholders,
- moderate the process of having the stakeholders to agree on goals, scope, purpose and strategy for such an innovation strategy.

5. Protecting Knowledge and Innovations

There is a need to sustainably raise awareness on IP, its impact and implications. Nevertheless the value of IP and the need to protect IP is not the same for all market segments, technologies, related innovations and societal needs. There is a lack of coherent and consistent IP policy across Africa and a strong asymmetry in the IPR landscape between Africa and Europe. A joint policy for sharing and protecting knowledge and innovation should be put in place and developed, while also taking the costs involved into consideration.

⁹ acatech “Innovation Collaboratories” (Germany), <http://www.acatech.de/grip-it>

Such an IP policy would help in raising awareness in promoting patent generations/applications. It should also consider the need to develop skilled IP experts in Africa.

African countries should be encouraged to develop IP policy that reflects national peculiarities while taking note of opportunities from future needs. It should be harmonized at the regional, continental and international levels. Such harmonization process will take time and there is a strong need to clearly identify what needs to be protected.

Protection system in Africa and its IP policy have to be developed so that they are market enablers. A difference should be made between patenting (which may kill innovation) and licensing, which may be key for the socio-economic development.

Some good practice examples were identified in Nigeria and Kenya, where IP culture points have been established, mainly at knowledge Institutions such as Universities and Polytechnics. These are established Technology Transfer Units that provide free equipment and IP training, facilitate patents filing and processing, and checking outcome.

A final good practice example comes from Norway. The Africa Project on Pharmacology aims to produce better health for Africa through affordable medicine. This model provides a methodology for analysing plants and IP training, contracts, patents and royalties.

Stakeholder's noted that challenges in protecting knowledge in sectors such as agriculture, energy, and climate change may provide opportunities for bi-regional cooperation.

6. Securing funding to foster the innovation process

Funding innovation is not only funding research. Whereas various sources of innovation funds exist, there is a pronounced inability to show the investment and business case for STI. Innovation needs to be feasible, exhibiting the ability to generate returns based on its deployment and on the ability to make a change. Therefore innovation is only efficient when the end-users and industry are actively involved.

Funding in the absence of an eco-system increases the problem of generating a business case. The contribution from intangibles has therefore to also be considered, as for example:

- access to talent
- presence of knowledge producers
- informal networks for innovators
- executive leadership (innovation has to be managed)

Stakeholder's identified several needs that should be satisfied and gaps that should be closed to guarantee funding, such as:

- African governments should share the risk of private sector investments in innovation and provide incentives for the private sector,

- The EU should facilitate the establishment of an African sustainable innovation fund¹⁰,
- The Africa-EU collaboration should support and match private sector initiated innovation programmes for Africa,
- Trials for ppp's as means of funding should be encouraged,
- Budgets for innovation should not be diverted to procurement,

The link between research and innovation is very important. It should however be strongly noted that innovation has a different implementation timeframe to research projects. Innovation is an on-going process that does not have to have an end-date. Innovation should be flexible in order to adapt to the needs of the users and the environment. Innovation policy, innovation strategy and all the related innovation funding structures should critically take these issues into consideration.

7. Conclusions

The CAAST-Net 2nd Stakeholder's Conference 'Steps to Innovation' brought together stakeholders in bi-regional research, policy, and innovation to examine the ways in which innovation can stimulate national development and to formulate recommendations for promoting innovation for sustainable development arising from bi-regional cooperation. Recommendations from the conference participants include:

- Fund applied research by supporting local, national, and global research networks working on key problems;
- Expand access to existing technologies and practices through multi-stakeholder partnerships and multidisciplinary approaches;
- Build learning partnerships that facilitate the transfer of knowledge and skills to partner countries and nurture a local capacity for innovation in those countries;
- Promote private sector and other innovation stakeholders' involvement and co-funding of the innovation process by creating sustainable networks and cluster initiatives, implemented based on innovation platforms and using collaboratories to guarantee participation and communication among all stakeholders.
- Stimulate innovation in partner countries through prizes, competitions, technical support, specialized funds, and tapping diaspora networks for capital and know-how;
- Expand global access to knowledge through an Open Access policy, allowing innovators the knowledge they need to address development challenges.

The outcomes of the CAAST-Net stakeholder's conference highlight the importance of innovation in addressing global challenges. Bi-regional cooperation on not only

¹⁰ Readers should note the recommendation to AMCOST in 2012 of an African research and innovation council.

research, but also innovation can deepen the understanding of the role STI plays in economic development and transformation.

What is also clear, however, is the need to more fully communicate the innovation landscape to stakeholders in both Africa and Europe. A deeper understanding of the policies, institutions, and actors governing innovation provokes a critical examination of the role of bi-regional cooperation in innovation.

The stakeholder's conference also highlighted the interest in innovation and bi-regional cooperation held by African and European stakeholders. Despite the challenges highlighted above, opportunities do exist for bi-regional cooperation to have an impact.

Over the years, some lessons have been learnt in the development of National Innovation System (NIS). A NIS emerges and is sustained in an environment that has educational, technical, commercial, social, financial, legal and institutional systems that are supportive of STI capacity building and economic growth.

It is also known that building research capacity is critical, yet other capacities are also essential to enable the application of new knowledge and tools.

Financial and institutional innovations are essential to overcome barriers to the adoption of new technologies. The absence of these creates serious constraints towards getting innovation to the marketplace. It is therefore imperative that STI policies focus on niches, locations, markets and priorities within the context of countries. It is important that the national context also drives the strategies for building an Innovation System.

CAAST-Net in proposing this view of Innovation as an innovation system implemented as a systematic process, is guided by the need to consistently add value to the bi-regional cooperation, with special emphasis on Science, Technology and Innovation. Innovation is identified as high priority and essential to driving national, regional and continental development, hence the emphasis laid on promoting a vigorous innovation policy for the cooperation. It is envisaged that the implementation of the policy will assist in deepening the understanding on the role of STI in economic development and transformation.

8. Summary of the main stakeholder comments and recommendations for action

- A joint STI policy for Africa-EU cooperation is a major need. This policy has to be integral to NIS policies as this is the foundation on which NIS policies are built¹¹.
- A policy and strategy for innovation should be based on a multi-level approach (institutional, national, regional) and should be linked to the Joint STI policy for Africa-EU cooperation.
- A joint policy and strategy for sharing and protecting knowledge and innovation should reflect the peculiar situation of Africa, taking into

¹¹ Readers should note the existence already of a high-level Africa-EU STI cooperation framework under the 8th partnership of the Joint Africa-EU Strategy.

consideration the difference between patenting and licensing and ensuring that the policy acts as a market enabler¹².

- Funding innovation should be clearly differentiated from funding research. Budgets for innovation should not be diverted to procurement.
- The EU should facilitate the establishment of a sustainable 'African Innovation Fund' to enable the planning, implementation and funding or co-funding of Innovation Initiatives¹³.
- Document and popularize case studies and proven successful industry-academia collaborations between Africa and Europe¹⁴.
- Promote and fund within the Africa-EU cooperation framework the creation of 'Interfacing Institutions' for the management and promotion of industry-academia cooperation.
- Promote and fund within the Africa-EU cooperation the creation of 'Sustainable Networks' and 'Cluster Initiatives' for Innovation solving thematic, multi-regional challenges.
- Promote and fund within the Africa-EU cooperation framework trials or pilots for 'Innovation Platforms' to study, evaluate and develop different forms of deployment and commercialization of innovation results to contribute to the financing of the socio-economic development of the targeted regions.
- Promote and fund within the Africa-EU cooperation framework trials or pilots for 'Innovation Collaboratories' to bring all the stakeholders together needed for the innovation processes.
- Within the EU-Africa cooperation framework promote the strengthening of human and intuitional capacity in teaching and research in response to emerging areas of science, technology and innovation through exchange and staff mobility¹⁵.

¹² Readers should note the establishment of the Pan African Intellectual Property Organisation (PAIPO).

¹³ Note the feasibility study conducted in 2012 into the establishment of an African Research and Innovation Council, the outcomes of which were presented to the 2012 AMCOST meeting.

¹⁴ Refer for example to the African Knowledge Transfer Programme of the UK government's Department for International Development.

¹⁵ Reviewers' comment: A NEPAD ASTII study shows that knowledge production in all countries studied, irrespective of their size, is dominated by the work of academics and scholars at the major universities. Few African Universities have programs with focus on innovation, technology transfer and industrial linkages. The design and provision of an African Science, Technology and Innovation Post-Graduate Course is proposed in CPA, the objective of which would be to build specialized skills in science, technology and innovation policy research and analysis, Africa as a whole requires a comprehensive project to train at masters and doctoral levels.

9. Annex

Keywords summary of the minutes of the CAAST-Net Conference

1. Promoting Industry and Academia Relationship

1.1 *Gaps / Needs*

- Need for innovation deployments as development tools
- Need for Universities to generate 'useful' ideas for industry
- Need to define what is meant by 'Industry' (services, goods, processes; VSE, SME, etc.)
- Need to understand that Innovation for industry is not only coming from universities/academia (centres, labs, clusters, society)
- Potential of the youth to be harnessed
- Need for skills provided at universities to be relevant to industry
- Need for associated labs (interface to guarantee transfer)
- Cluster initiatives as a link
- Need for entrepreneurship/ leadership training at Universities
- Need to generate Innovations for enhancing democracy
- Innovation needs industry involvement
- Need for incentives & credits to promote University to Industry linkage
- How to make use of the diaspora?
- Funding for transfer of innovation to industry
- Need for sustainability index for Africa (needs, numbers assessment, M&E, observatory)
- Need for STI-strategies (at all levels)
- Need for STI policy in Africa (at all levels)
- Innovation platforms (framework & technology)
- Need for incubation strategy

1.2 *Good practice and examples*

- Documented case studies
- Mobile business
- Cluster initiatives to enhance innovation
- Encourage mobility of scientists
- Centres bridging moderating university & industry cooperation
- Regional networks with matching funds
- Networks of different speeds

1.3 *Potential for bi-regional cooperation*

- Informal economy (micro enterprises)
- Interface institutes (need for drivers)

- Create implementation/ associated institutions in Africa (problem solving)
- Joint centres for development
- Grand challenges are cross-border
- Innovation parks (regional/local)

2. Valorising different sources of knowledge and innovation

Valorisation relates to value addition, effective utilization of knowledge, translation of ideas into goods and services, meeting market demands (scale dependent), establishing role of intermediaries, identifying non-market demands, addressing risk management, ability to develop a 'listening ear'.

2.1 *Gaps / Needs*

- Policy / practice gap
- Research / end-user gap
- Coordination /framework, structures
- Language, literacy / end-users
- Informal sector & formal sector (for ex. Gap between researcher and industry)
- Absorptive capacity
- Governance
- Knowledge gap
- Communication gap between stakeholders
- Trained social workers / mentors
- Competence recognition at all levels
- Monitoring
- Context (lack of understanding of context)

2.2 *Good practice and examples*

- Promote functional information sharing
- Civil society organizations – political process
- Emphasize more on Coordination rather than Competition
- Making formalization of business sector easier (good governance)
- Knowledge sharing
- Shared space / facilities
- Use-driven NGOs
- Reduction in donor dependence
- Move research results out of projects
- Innovations→ capacity to manage change
- Promote and strengthen traditional knowledge in health – fevers, malaria

2.3 *Potential for bi-regional cooperation*

- Project design including implementation (social context)
- Tied aid (earmarked)
- Why nations fail (institutions)
- University –industry links as a policy
- Mechanisms for policy learning

2.4 *Structural approaches to develop interfaces and to communicate knowledge*

- PhDs – industry link
- Mechanisms for policy learning
- Every project as a learning opportunity
- Culture of learning –need for a change in culture
- Listening
- Monitoring & evaluation

3. Protecting knowledge and innovation

3.1 *Gaps / Needs*

- Capacity building especially in Africa
- Awareness raising of IP
- Laws on geographical indications and utility models
- Lack of IP policy in negotiations (national, regional, international level / contract – lack of strategic interest in negotiation)
- Negotiation capacity regarding contracts
- Special skills to package proposals for European calls for projects
- Low venture capital and research and development funding dedicated to support protection of knowledge
- Efficient IP protection remedy
- Cost of protecting knowledge and sharing policy
- Asymmetry IPR landscape between the two regions (continent)s and within the continent

3.2 *Good practice and examples*

- Nigeria and Kenya: IP culture points (Each University has a Technology Transfer Unit, free equipment and training; checking outcome; IP policy helps to raise awareness and to promote patent applications.
- Norway – Africa Project on Pharmacology – Aim to produce affordable medicine ('Better Health for Africa' – it provides

methodology analysing plants and IP training, contracts re patents and royalties).

- Communication, transparency, mutual trust and respect.

3.3 *Potential for bi-regional cooperation Africa*

- Agriculture and water; (protecting of knowledge) too many losses in Africa; how to store; process to reduce post-harvest losses
- Energy – research interests protecting environment. Energy – Solar energy; produce and service the solar systems.
- Publications; books; patenting; innovation (employment and wealth creation); royalty agreements.
- Building skills of the people to protect at the same levels (capacity building).

4. **Securing financing to foster the innovation process**

4.1 *Gaps / Needs*

- Funders need to be willing to take risks
- Intellectual Property Rights challenges
- Technology driven innovation can outrun vulnerable populations
- Market opportunities need to be clarified by market studies and economists
- How to make innovation work for vulnerable populations
- WTO and Africa opportunities Act
- Weak link between research and development

4.2 *Good practice and examples*

- SKA (*Square Kilometre Array* radio telescope) project is a good practice example. Nigeria also recently launched two satellites (a communication and an earth-observation satellite).
- Collaboration often proves to be more beneficial to solo innovation activities.
- Example of innovation through ICT deployment to provide update information to Kenyan farmers.
- Introduction of simple innovation techniques, such as process and storage technologies for fruits.
- The Indian Presidential Awards that provides funding for successful projects that excelled over a period of time.
- Bissap – hibiscus drink
- AFTER – African Food Revisited by Research (and FP7 project)
- SAFIPA <http://safipa.com/> & COFISA <http://www.cofisa.co.za/files/> (Finnish/South African seed funding partners)

4.3 *Potentials for bi-regional cooperation*

Food security – Matters such as chemicals used in foods should be regulated; regional policies should be developed bi-regionally in order to develop the local export market.

5. Additional Issues and Structural Approaches

5.1 *Structural approaches to develop interfaces and communicate knowledge (structures for technological transfer)*

- Matching ideas and finances: local-local; regional-regional
- ‘Expo’/Virtual matching of innovators with donors and investors
- Social enterprises – impactful innovation and tax advantages
- Development Sector: Move from planners to searchers
- Tap regional markets
- IT deployment should be approached & supported in both directions
- Promote Incubators and clusters
- Structural approach to develop interfaces and to communicate knowledge through ‘Economic Commission for Africa’
- Strong regulations on IT
- Establishment of incubators at academic institutions

5.2 *Further Issues include:*

- Multi stakeholder approach should be encouraged
- The long gestation period should be noted (sometimes 10yrs +)
- Stakeholders change over time
 - Donors must be flexible
 - Need long-term financing
 - Europe to finance an innovation fund that is managed by the ADB
- Diversify funding resources
- Coordinate different funding resources
 - EU & counter funding for industry at country and regional level
 - African Governments to share the risks of private sector investment in innovation
 - Provide incentives to private sector
 - Link research and development
 - Capacity building of weaker consortium partners
 - Local: operate budgets of innovation not budgets of procurement
 - Link research fund to development funding (IFC, ADB, AFD...)
- Flow of information to people who will use this technology is necessary
- Information flow to people who can service this technology for people
- To train people to use this technology
- People to establish companies

- Academia involvement to teach that technology and for know-how
- People to go abroad to exchange information
- Information should be translated into local languages