



# Outcomes and Lessons Learned on the Nature of the Broader EU-Africa Partnership

A CAAST-Net Plus Work Package 4 Perspective



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## 1. EXECUTIVE SUMMARY

This compendium summarises the findings of two bibliometric investigations related to climate change and health; the recommendations of three CAAST-Net Plus Forum reports and three reports from engagements with African Regional Economic Communities (RECs) and/or Science Academies. The readers are encouraged to read the full reports for further information in the CAAST-Net Plus website.

The bibliometric analyses reveal that the CAAST-Net and CAAST-Net Plus supported by the Framework Programmes appear to have been successful in encouraging more and better bi-regional science, technology and innovation (STI) cooperation for enhanced outcomes. Furthermore, the high degree of current collaboration indicates that there might be limited scope for additional expansion and hence, it is suggested that African governments, multilateral organisations and their international partners should focus in developing research capacity. Finally, the small scientific size of the African countries and the lack of acceptance that innovation is the fundamental cornerstone of economic growth, employment, international competitiveness and development lead to relevant recommendations for the EU-Africa research and innovation (R&I) partnership.

The first forum report focuses on establishing knowledge-sharing and match-making structures between different sectors; between Africa and Europe and strengthening national and multinational innovation systems. The second forum report focuses on transferring knowledge into solutions; lessons from the CAAST-Net Plus project and the Development of Research Uptake in sub-Saharan Africa (DRUSSA) project; and building partnerships for research uptake and knowledge transfer. The third forum report considers potential approaches towards the implementation of the Africa-EU R&I Roadmap on Food and Nutrition Security and Sustainable Agriculture (FNSSA)<sup>1</sup>. The participants identify a number of challenges and propose the establishment of a knowledge management and communication system (KMCS) as well as a dedicated EU-AU team in steering the implementation of the FNSSA Roadmap.

The workshop with the representatives of the African RECs recommended the active participation of the RECs in STI (e.g. alignment of priorities and engaging in Africa-EU initiatives such as the ERAfrica programme); even though it was recognised that the RECs need further support for capacity development. The second workshop aimed to facilitate dialogue between RECs and their European counterparts. The third workshop was brought together members of African and European science academies. From this workshop, one crucial challenge that was identified was that African science academies were not fully aware of the Africa-EU R&I Partnership and the relevant instruments in existence; other key challenges were lack of funding and disinterest of policy makers.

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<sup>1</sup>Roadmap towards a jointly funded EU-Africa Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture [https://ec.europa.eu/research/iscp/pdf/policy/eu-africa\\_roadmap\\_2016.pdf](https://ec.europa.eu/research/iscp/pdf/policy/eu-africa_roadmap_2016.pdf)

## 2. INTRODUCTION

The *Network for the Coordination and Advancement of Sub-Saharan Africa-EU Science and Technology Cooperation (CAAST-Net)* was a project funded by the European Commission. The establishment of the Network followed the development of the Joint Africa-EU Strategy during 2007. The purpose of the Joint Strategy is to take the Africa-EU partnership to a new strategic level with a strengthened political dialogue and enhanced cooperation at all levels.

*CAAST-Net was conceived against the background of a global consensus that capacity in science and technology is essential to economic competitiveness, sustainable development and poverty reduction. This new geo-political relationship reflects the global trend towards seeing scientific and technological research, development and innovation (RDI) as a driver of economic growth, a move away from a 20<sup>th</sup> century focus on capital, natural resources and labour. CAAST-Net's goal statement was as follows:*

*“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”. (CAAST-Net Plus 2009)*

CAAST-Net operated during the period 2008-2012 and it was succeeded by CAAST-Net Plus (2017). CAAST-Net Plus is a network of 26 partner organisations from Europe and sub-Saharan Africa working together to support bi-regional cooperation in R&I. CAAST-Net Plus aims to:

*“Encourage more and better bi-regional STI cooperation for enhanced outcomes around topics of mutual interest, and particularly in relation to the global societal challenges of climate change, food security and health.*

*Foster discussion among stakeholders for gathering informed opinion and experience about the bi-regional cooperation process, formulating and disseminating it in such a way as to be admissible to the formal bi-regional STI policy dialogue process and to programme owners.” (CAAST-Net Plus 2012)*

DST is co-leader in work packages (WP) 4 and 5. The objectives of WP 4 are as follows:

- To provide a knowledge base to enrich formal and informal policy dialogue processes, including analytical evidence drawn from monitoring and analysing the progress and results of bi-regional STI cooperation;
- To develop and implement concepts for bi-regional STI policy stakeholder forums;
- To support and monitor the implementation of policy dialogue recommendations at the request of the Bureau of the Africa-EU STI policy dialogue platform; and,
- To consult a wide base of stakeholders to gather and consolidate evidence to inform international cooperation policies and/or instruments.

In the above context, DST has commissioned the current bibliometric analyses, which aims to provide an overview of the status on research collaboration between Africa and the EU.

This compendium aims to synthesize the findings from the two CAAST-Net Plus bibliometric studies in health and climate change, and to summarise the outcomes of three Stakeholder forum reports as well as the reports from engagements with African RECs and Science Academies.

### **3. BIBLIOMETRIC ANALYSES ON AFRICA-EUROPE RESEARCH CO-PUBLICATIONS**

The bibliometric analyses related to research co-publications in climate change and health are informed by a literature review. The literature review covers definition and types of research collaboration; collaboration motives, objectives and impacts and collaborative R&D&I patterns in Africa.

The literature review related to research collaboration identifies the following:

- a. A number of authors suggest that international collaboration is replacing other models (e.g. international bursaries) as the preferred method of building scientific capacity in developing countries. However, there are a number of caveats linked to the above statement. The existence of a critical research basis appears to be a prerequisite.
- b. Collaborative research as it is manifested in co-authored articles including African researchers has increased substantially since 2003.
- c. African collaboration takes place in particular disciplines neglecting scientific and technological disciplines underpinning modern economies and emphasised in other countries (e.g. China).
- d. There is limited collaboration among African researchers.
- e. Individual African countries exhibit substantially higher collaboration patterns than the rest of the world. Twenty-nine African countries published more than 90% of their research articles in collaboration with other countries.
- f. Apart of the international forces leading to collaborative research, availability of resources appears to lead collaboration in Africa. Local historical and cultural characteristics are further superimposed on the phenomenon.

#### **3.1 Bibliometric Analyses on Europe-Africa Research Co-publications in Climate Change**

Climate change is one of the top priorities in the bi-regional cooperation between Africa and the European Union. The Joint Africa-EU Strategy identifies that the significance of climate change lies in its global interconnection and its impacts on water resources and food security. Environmental degradation and climate change undermine sustainable development and represent threats to the achievement of the Millennium Development Goals. The issue is of particular importance for the European partners too. The EU decided that at least 20% of its budget for 2014 to 2020 – as much as €180 billion – should be spent on climate change-related actions. To achieve this increase, mitigation and adaptation actions will be integrated into all major EU funding programs.

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The bibliometric analyses utilise the Web of Science and is based on an information retrieval approach emphasising precision without compromising recall.

The bibliometric analyses revealed that climate change research in Africa and in collaboration with Europe increased substantially during the period 1993-2015 – albeit from a very small base. The estimated increases were substantially higher than the growth of African articles in all disciplines during the period. Estimation of the ratio of climate change research to total research shows that Africa’s ratio is three times as high than that of China, India and Brazil – indicating a sensitivity of continental priorities to international collaboration. During 2015, the activity index of climate change research in Africa was 1.5. This means that African-based institutions were undertaking 1.5 times more research related to climate change than what is expected by the continent’s total research outputs. The Europe activity index was 1.3 (see figure number of articles<sup>1</sup>). The analysis provides support to the evidence from the literature that international research support is critical for a number of countries in Africa.

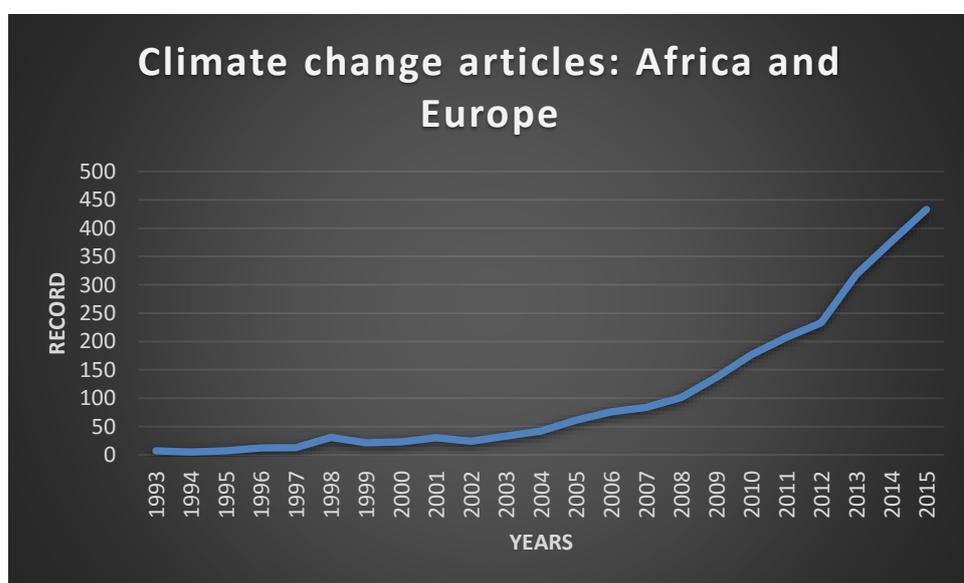


Figure 1: Climate change articles: Africa and Europe in collaboration 1993-2015

### EU-Africa Climate Change Co-publications by the Numbers

**Forty six percent** of the climate change research in Africa is produced in collaboration with Europe.

The Africa-Europe collaboration (all disciplines) contributes **30%** of the total research output of the African Continent and a number of countries appear to be dependent on international collaboration for their research activities. While it is difficult to estimate the counterfactual – what would have happened without the EU collaboration – it can be argued that at least for a number of African countries, lack of international support would have devastating effects for their research systems.

The **FP6** and **FP7** had a substantial impact on the number of co-authored climate change articles. The estimated impact is substantially higher than the growth of African climate change articles (without participation from European institutions) and the growth of all African articles (in all disciplines).

Climate change articles with institutions from Europe performed better in terms of citations per article and citations without self-citations than the set without authors from institutions in Europe.

Identification of the funders in the set of articles co-authored among authors from European- and African-based institutions shows that the European Union in its various permutations was the most often mentioned funder. It was mentioned in **158 articles**. The National Research Foundation (South Africa) was the second most cited funder (**73 times**). The European Union was mentioned **twice** as often as the NRF.

### 3.2. Bibliometric Analyses on Europe-Africa Research Co-publications in Health Research

In the bibliometric analyses reports it reveals that the growth rates of the average African scientific discipline during the FP6 period (plus 1) was growing almost at the same rate as the African-Europe collaborative articles in health. The growth in the African health articles without European co-authors was almost 10% higher. During the FP7 period (plus 1), the growth in the collaborative articles was higher than in the articles published in Africa, excluding collaboration with authors in Europe, and in African articles of all disciplines. It is noted that the growth in the collaborative articles during FP7 was substantially higher than in the FP6 period. It appears that FP7 had a positive influence in the production of co-publications in the field of health. Comparisons of the citation profiles of the African articles in health produced including and excluding collaboration with authors based in Europe, shows that health articles with European-based institutions perform better in terms of citations per article than the set without European-based collaborators.

The number of health articles with at least one author from an institution in Africa and those in collaboration with an institution based in Europe increased substantially during the period 1993-2015. The number of health articles have increased from 3 265 during 1993 to 16 808 articles during 2015 – a 5 fold increase. The collaborative articles in health increased from 631 articles in 1993 to 5 312 articles during 2015 – an 8.4-fold increase. Identification of the number of health related articles with authors based in African institutions but without co-authors from European institutions shows an increase of 4.3-fold over the period. This growth is almost half of the collaborative African-Europe health growth. Collaboration with authors

from European-based institutions appears to increase the number of collaborative articles over and above the rate of articles without partners from European institutions (see figure 2).

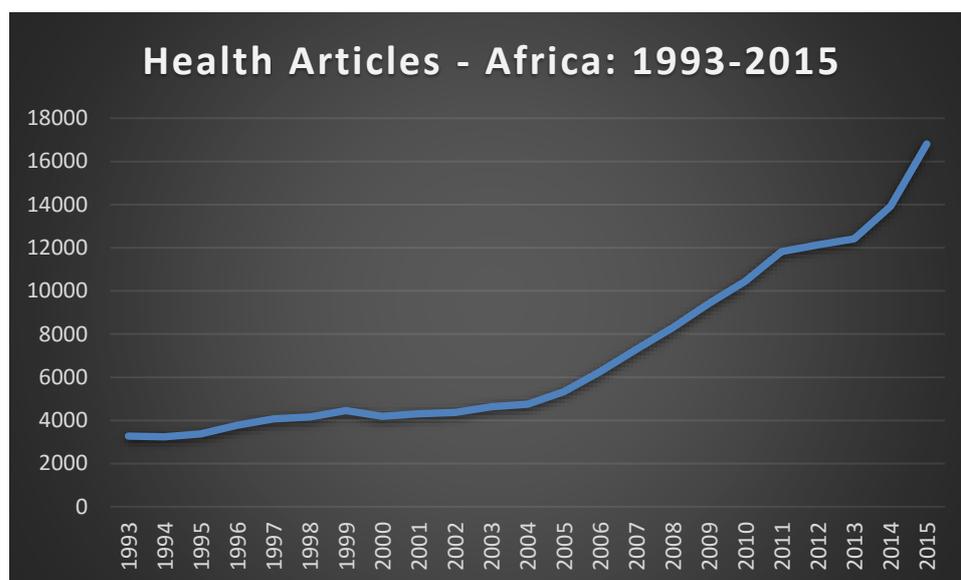


Figure 2: Health articles published in Africa from 1993-2015

### EU-Africa Health Co-publications by the Numbers

During 2015, **31.6%** of health articles published in Africa were produced in collaboration with European partners.

Health articles constitute **36%** of all articles produced in Africa during 2015. This figure is higher than those of China (**27%**); India (**28%**) and Russia (**13%**) indicating the importance and sensitivity of the topic for Africa.

Investigation of the funders in the set of articles co-authored among African and authors institutions in Europe shows that the Wellcome Trust was the most mentioned funder, cited in **3041 articles**. The National Institutes of Health were mentioned **1846 times**. The European Union (in its various permutations – European Commission, European Union; European Community, etc.) was mentioned **1252 times**. The Medical Research Council UK followed with references in **1143** articles. Bill and Melinda Foundation was mentioned **805 times** and the National Research Foundation **614 times**. The Tunisian and Egyptian Government also appeared in approximately **90 articles** each.

When authors from European institutions were excluded, the most popular funder was the variety of National Institutes of Health with more than **4300 references** over the period. The National Research Foundation followed with approximately **2500 references**.

### 3.3. Conclusion and recommendations

CAAST-Net and CAAST-Net Plus together with the Framework Programs appear to have been successful in encouraging more and better bi-regional STI cooperation for enhanced outcomes related to climate change. The success is particularly crucial, as Africa had limited, if any, expertise in the field in the 1990s. It is suggested that similar approaches can be utilised to develop research capacity and cooperation in other fields of common interest and priority. The collaborative patterns in a variety of African countries reveal dependency of the local research systems on international resources. Furthermore, the high degree of current collaboration indicates that there might be limited scope for additional expansion. African governments, multilateral organisations and their international partners should focus on developing research capacity and aim to institutionalize the governance and support of science, technology and innovation. Providing funding rewards for research publications has been proven effective in South Africa and can be used across the continent.

The sub-critical size of research systems, lack of funds for co-financing and dependence on international resources are manifestations of the refusal or neglect of African governments to accept that innovation is the fundamental cornerstone of economic growth, employment, international competitiveness and development.

The relatively small size of Africa's scientific outputs makes the issue of research priorities of critical importance. Prioritization is required across the broad main domains (e.g. environment versus health versus manufacturing etc.) and within each domain (e.g. local effects and mitigation versus global effects of climate change). The field of foresight has been identified to be useful in that domain. National and regional exercises can introduce the concept of priorities and foresight to the relevant authorities. Countries with expertise in the field with the support of multilateral organisations and the African partners can lead in the effort. Such exercises could also guide the European Commission in enhancing its collaborative efforts with Africa.

## 4. FINDINGS FROM CAAST-NET PLUS MULTI-STAKEHOLDER ENGAGEMENTS ON STRATEGIES FOR ADVANCING AFRICA-EU COLLABORATION IN SCIENCE, TECHNOLOGY AND INNOVATION

Between 2014 and 2016, CAAST-Net Plus organised six gatherings which brought together African and European experts to deliberate on strategies that could strengthen Africa-EU cooperation in STI in thematic areas of health, climate change and food and nutrition security, especially across a number of sectors. Stakeholder forums and workshops were held in Uganda (2014), South Africa (2015 and 2016), and Ethiopia (2016).

The main objective of these engagements was to discuss the potential role of stakeholders such as representatives from African RECs, research institutions, science academies, government departments, scientists, and the broader public sector, with the aim of sharing and exchanging information on their priorities, strategic objectives and milestones in STI.

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Similarly, the aim was to identify, modalities, mutual priorities and synergies for closer collaboration.

Below are some of the key outcomes from the events, on the lessons learned on advancing Africa-EU R&I collaboration:

- a. Knowledge-sharing and matchmaking structures should be established to support multi-stakeholder involvement in R&I projects. Some suggestions include providing incentives in linking research with entrepreneurship; embedding small-scale farmers and entrepreneurs, in research and projects for research uptake and innovation; and fostering multidisciplinary research and Involvement of the diaspora, women and youth.
- b. There is a need to foster closer collaboration between academia and industry through the African RECs.
- c. Representatives from different sectors support the drive to develop centres of excellence and think tanks.
- d. National and multinational innovation systems need to be strengthened. This could be achieved through the adoption of a program similar to EUREKA for Africa; reinforcement of the One Health Initiative; establishment of African and European STI attachés in Brussels and Addis Ababa (as the locations of the EC and AUC respectively); and policy advocacy for science to promote local innovation systems.
- e. Policy-makers and researchers often have different priorities, timelines and different agendas set in different institutional environments. The participants suggested that regular dialogue between ministries of government and universities could resolve institutional cultural differences.
- f. Minimal community engagement in the early stages of research development inhibits effective community engagement with research findings. Community members should be involved early in the research process and be informed of the research results.
- g. Science-informed advice is sometimes overlooked by policy implementers due to stringent political timelines. It was suggested that regional bodies should be encouraged to share good practices in evidence-informed policymaking.
- h. Foster the engagement of key actors across the whole FNSSA value chain, and further stimulate the engagement of existing and new national, regional, philanthropic and private funders and their programmes/schemes in support of the FNSSA Roadmap.
- i. Present the short- to medium-term investments needed and to explore concrete long-term options for the implementation of the FNSSA Roadmap; and,
- j. Determine a long-term collaboration platform, including all relevant actors and existing initiatives, along the entire FNSSA innovation value chain – from knowledge generation to knowledge exploitation.

### Recommendations for involving Africa's RECs in the EU-Africa STI Partnership

- a. The RECs have the potential to conceptualise new priority areas that will inform bi-regional STI cooperation.
- b. The RECs and the National Science Academies may be invited to participate in HLPD Bureau meetings.
- c. RECs may require additional resources in order to establish networks of regional and national contact points (NCPs), as well as the establishment of an Inter-RECs STI Forum.
- d. The workshop suggested that the RECs could participate in the ERAfrica initiative and other Africa-EU projects.
- e. The document includes summaries of the STI strategies of the various RECs.
- f. Continued dialogue between RECs and science academies in Africa-EU collaboration in STI policy and practice.
- g. Participation of academies in policy development may assist in narrowing the gap science-policy.
- h. Development of a research funding portal, i.e. the ERAfrica Initiative portal, as an optional mechanism for research funding collaboration.

Participants from the various engagements identified a number of challenges in STI partnerships. Some of the key challenges include:

- a. A gender imbalance in some of the EU-Africa R&I initiatives, more especially those related to the FNSSA sector, effective approaches are required to involve women and the youth in agricultural activities;
- b. A lack of transparency, trust, and flexibility exists between most research partners, which consequently can affect the success of the partnership;
- c. Involving all stakeholders within the value chain from the very start of the research process ensures that the R&I process is not only consultative but inclusive;
- d. Lack of cash contribution, substituted with in-kind contribution may threaten the inclusivity and success of the partnership;
- e. Communication of R&I to farmers is often weak, and research outcomes sometimes straddle between researchers and policy-makers;

- f. Inadequate monitoring and evaluation measures of RECs STI engagements; and,
- g. Foster collaboration between Specialised Scientific Committees and the RECs, science academies and NASAC and EASAC.

In addressing the challenges above, more successes could arise from the Africa-EU STI partnership, in example, the establishment of a knowledge management and communication system (KMCS), as well as a dedicated EU-AU team in steering the implementation of the FNSSA Roadmap, as suggested at the Stakeholder Forum held in Ethiopia in 2016.

## **5. CONCLUSION**

In summary, CAAST-Net and CAAST-Net Plus supported by the Framework Programmes appear to have been successful in encouraging more and better bi-regional science, technology and innovation (STI) cooperation for enhanced outcomes. As the current collaborative activities reach saturation point, it will be important that the efforts are directed accordingly towards capacity development.

While research has benefited from the collaborative efforts, it is apparent that the African governments are in the early stages of embracing the value of science and technology for economic and social development. As such, EU-Africa collaborative efforts should continue focusing on the need for bi-regional STI initiatives.

The stakeholder forums appear to have been constructive as they have the potential to accelerate implementation of bi-regional STI policies by bringing together key actors crucial to policy processes. Lastly, the recommendations emanating from these discussions held during CAAST-Net Plus multi-stakeholder events could be taken forward by initiatives such as LEAP-Agri and the Research and Innovation Network for Europe and Africa (RINEA).