

Facilitating and Expanding the Research Landscape in Africa through Regional and International Scientific Collaboration: AGNES

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Summary

AGNES (the African-German Network of Excellence in Science) is a young supra-regional contact structure, conceptualised by 17 scholars from 11 sub-Saharan African countries and 4 German scholars at a workshop held in Addis Ababa in 2011. The 21 Founder Members of AGNES had 3 things in common: (i) they were passionate about the state of affairs in sub-Saharan Africa, especially w.r.t. higher education and research, (ii) they were all funded at some point by the prestigious Alexander von Humboldt Foundation (AvH) that counts 52 Nobel laureates amongst its alumni and is based in Bonn, Germany, and (iii) they had retained active scholarly collaborations with researchers in Germany / Africa. The envisaged role of AGNES was to strengthen academic excellence in sub-Saharan Africa by: (i) promoting regional networking and professional exchange between excellent scholars within the region and Germany; (ii) to introduce young African researchers to Germany as a quality research destination via the Humboldt Foundation as sponsor of excellent individuals; (iii) to promote Africa as a research destination with many and unique research possibilities to highly qualified German scientists; and (iv) to participate in ongoing discourse on expansion of scientific and academic capacities – also regarding the role of research and innovation for sustainable development in sub-Saharan Africa.

Ultimately, AGNES aims to support social change in Africa, which is creating more scope for individual achievement, and making academic excellence a socially recognised criterion for professional development in Africa. To this end, AGNES promotes science, technology and innovation through higher education by partnering with a technological and economic giant, the Federal Republic of Germany. The aims of AGNES tie in with the African Union’s Agenda 2063: The Africa we want, with a special emphasis on the AU’s Call to Action to “catalyse education and skills revolution and actively promote science, technology, research and innovation, to build knowledge, human capital, capabilities and skills to drive innovations and for the African century”.

In the 5 years of its establishment, AGNES has developed into a highly professional body that has created 2 sponsorship programmes. Since the inception of the AGNES Junior Researcher Grant in 2012, we have awarded grants to 60 African postdocs. This recognition of individual excellence has served as encouragement for many of the grantees: some have been offered lectureships in their home countries, others have attained academic promotion, many have improved their academic standing by publishing more papers and securing postdoctoral positions, including the prestigious AvH fellowships for a postdoc in Germany. The AGNES Intra-Africa Mobility Grant, inaugurated in 2016, enabled us to comprehensively fund 17 Masters and Doctoral students to spend up to 2 months abroad in the region, linking up with experts for critical aspects of research and initiating new collaborations on the continent. The academic benefits for the host and grantee are numerous.

The AGNES network, thus, fulfills its mandate to enhance the leading role played by research and innovation in sustainable development in Africa by representing members at different fora, such as Humboldt Colloquia in Africa, USA and Germany; at regional conferences, and by initiating the participative involvement of African members into German policy-making w.r.t. funding/plans for development in Africa. AGNES brings the expertise of African Humboldt alumni together in an outwardly visible manner. Our funding programmes strengthen cooperation among African scholars and facilitate scientific exchange with Germany on the basis of scholarly excellence.

Introduction

It is agreed by all stakeholders and role players that higher education is key to national development and global competitiveness, and that higher education is the tool so desperately needed in Africa to catch up with the more technically advanced countries that dominate the world economies on the back of their impressive knowledge-based skills set. The importance of higher education and science/technology is also entrenched in the African Union Agenda 2063 [1] and strategies for implementation of the Agenda, such as the Continental Education Strategy (CESA 16-25) [2] and the Science, Technology and Innovation Strategy for Africa (STISA 2024) [3].

One of the technically advanced “giants” is the Federal Republic of Germany: a country with very few natural resources that capitalises, instead, on “people power” by providing its citizens with technological skills training and quality education at all levels to improve and maintain high socio-economic conditions. Moreover, Germany actively promotes science, technology and innovation (STI) through higher education by supplying competitive funding to its large number of globally reputable/acclaimed higher education and research centres and to programmes of research.

In sub-Saharan Africa with its unique challenges, no one country can boast the above-mentioned feats, despite being rich in natural resources (such as rare and precious metals, fossil fuels, diverse agricultural products and wildlife) and having a burgeoning youthful population to educate and train as future leaders and labour force. How can we, in practice, catch up to the economic, technological giants (like Germany)? *Not through competition but through co-operation.*

The African-German Network of Excellence in Science (AGNES) is a young supra-regional contact structure that was developed with the overarching aim in mind, to link researchers in Africa with one another and with researchers in Germany. The Alexander von Humboldt Foundation (AvH) is well-known throughout the world as a prestigious (and generous) proponent of excellence in research, with more than 28 000 alumni (“Humboldtians”) world-wide. From the distribution of Humboldtians world-wide (Table 1) it is evident that sub-Saharan Africa has excellent scholars, albeit the lowest number in this group. When we further look at the location of these Humboldtians, we find that the 617 are patchily distributed, with Nigeria and South Africa having the lion share of around 190 alumni each, followed by Cameroon, Ethiopia, Sudan and Kenya with 53, 34, 25 and 22 alumni, respectively, and the rest are spread in smaller numbers over 24 countries [4]. Thus, although there is world-wide acknowledged scholarly expertise in the region, this is very dispersed and the challenge is how to enhance interconnection and visibility of Humboldtians in sub-Saharan Africa to effect a noticeable change because it is realised that scholars have a prominent part to play in the region – not only for research and development of solution strategies, but also in civil society, politics and business.

Table 1. Distribution of Humboldtians in the world as at February 2017 [4]

Continent/Region	Number of Humboldtians
Europe	14 327
North America	5 683
Asia	5 498
Central and South America	1009
Middle East, North Africa	754
Australia, New Zealand, Oceania	665
sub-Sahara Africa	617
Total	28 553

Furthermore, excellence has become a societally recognised criterion for career development, especially in higher education institutes, and it is imperative that excellent researchers expand the research landscape and promote science, technology and innovation through higher education. In this way, younger generations of excellent scholars can be inspired and encouraged to work together in the region and serve as quality educators.

AGNES and its governance

AGNES was conceptualised in Addis Ababa in November 2011 at a special workshop sponsored by various German stakeholders and attended by 21 Humboldtians (17 Ambassador Scientists, prize winners and Presidents of Humboldt Alumni Clubs in sub-Sahara Africa, and 4 German Humboldtians). The Founding Meeting was attended by the following German stakeholders in higher education: representatives of acclaimed institutions (Goethe Institute, Germany Academy of Sciences Leopoldina, German Academic Exchange Programme = DAAD, and the Humboldt Foundation), and representatives of various German Federal Ministries (Federal Foreign Office, Federal Ministry of Education and Research, Federal Ministry of Cooperation and Development). A Steering Committee was appointed to initiate the actual formation and workings of such a network and in March 2014 AGNES was officially launched and constituted in Nairobi. The first Governing Board was elected from the Founder Members: Dr HG Marco (South Africa, Chair), Prof. J Gebauer (Germany, Vice-Chair) and Prof. HI Boga (Kenya, Secretary) to serve a term of 2 years. In December 2016 the elections for a Governing Board took place in Ouidah: the incumbent Chair and Vice-Chair were re-elected and the Secretary is Prof. OC Adebooye (Nigeria). A Board of Trustees was also appointed to monitor and support the duties of the Governing Board: the 6 Trustees represent Germany and 4 broad regions of Africa). Board Meetings and AGMs are held in different countries in Africa to facilitate greater participation of AGNES members. Members are drawn from Humboldtians in the region and their research collaborators in Germany. Membership is free, and members agree that AGNES may host their professional information in a Database of Expertise. The duties of the Chair are supported by an administrator.

AGNES programmes

The envisaged role of AGNES is to strengthen academic excellence in sub-Sahara Africa by: (i) promoting regional networking and professional exchange between excellent scholars within the region and Germany; (ii) to introduce young African researchers to Germany as a quality research destination via the Humboldt Foundation as sponsor of excellent individuals; (iii) to promote

Africa as a research destination with many and unique research possibilities to highly qualified German scientists; and (iv) to participate in ongoing discourse on expansion of scientific and academic capacities – also regarding the role of research and innovation for sustainable development in sub-Saharan Africa.

- (i) Regional networking and professional exchange is promoted in two ways: (a) funding young postgraduate students via the AGNES Intra-Africa Mobility Grant, and (b) Participating at specialist conferences (Humboldt Kollegs) and inviting leading German scholars to participate too. For the sake of brevity, I shall only discuss (a) here. AGNES recognised, through various conversations with students, that there is a great need for mobility funding in the region. Students needed to access certain expertise or clusters of instruments that are not available in their home country, but they lacked the funds and the courage to network. We are grateful to the German Ministry for Education and Research (BMBF) for the comprehensive Grants that allow postgrad students to do part of their research in another sub-Saharan African country with a research host of their choice for up to two months. Not surprisingly, we received 139 applications in 2016 before the cut-off time. A total of 17 applications were funded, 8 females and 9 males, 13 Doctoral and 4 Master students. Table 2 provides details on the origin of the Grantees, their academic disciplines and the location of the host institutes. Although South Africa was a favourite research destination, it is heartening to note that countries like Tanzania and Uganda also benefitted from this programme, and that Francophone Africans visited Anglophone countries in pursuit of their research programmes (Table 2). The grantee reports on this opportunity reveal the true value of the Mobility Grant, which goes over and beyond the material value. There is an echo in all the reports of how much this Grant is appreciated by all concerned: home supervisor of the grantee, the grantee, and the host supervisor, for all parties benefit from the scientific and cultural exchange.

Table 2. AGNES Intra-Africa Mobility Grants awarded in 2016

Country of Origin & number of Grantees	Destination (Host location) & how many Grantees selected this destination	Academic Discipline (alphabetical order)
Benin (2)	Benin (1)	Agronomy
Botswana (1)	Cameroon (1)	Biochemistry
Cameroon (5)	Kenya (1)	Bioinformatics
Kenya (3)	Nigeria (1)	Ecotoxicology
Nigeria (5)	South Africa (12)	Engineering
South Africa (1)	Tanzania (1)	Gender Studies
	Uganda (1)	Mathematics
		Microbiology
		Plant isotopes
		Plant physiology
		Physics

- (ii) Introducing young African researchers to Germany: AGNES disseminates information about funding opportunities in Germany, and especially we promote the postdoctoral fellowships of AvH. These stipends are not only a recognised mark of excellence, but the Humboldt Foundation is generous in its sponsorship and they have a very good alumni sponsorship programme, including giving incentives for alumni to return to their home countries so that a brain drain or academic poaching does not occur. This is exactly what

is required in Africa: a recognised global leader in academic research that is open to taking postdoc fellows from developing countries, and then encouraging and enabling them to return home at the end of the fellowship without breaking the collaborative ties that had formed between the German and the African fellow. Hence, we also actively seek out talented young postdocs to inform and encourage them to apply to AvH for a postdoc fellowship in Germany. In 2012 we launched the AGNES Grant for Junior Researchers that acknowledges excellent, recently graduated PhDs and introduce them to the idea of doing a postdoc in Germany. Since then, we have annually awarded the grant and now a total of 60 young Africans have received this AGNES Grant, which is sponsored by AvH, BMBF and TWAS. This outward recognition of individual excellence has stood the grantees in good stead: some have been offered lectureships in their home countries, others attained academic promotion, many have improved their academic standing by publishing more papers and securing postdoctoral positions, including the prestigious AvH fellowships for a postdoc in Germany. The number of Humboldtians has increased in Africa and this can only be good news for the region. Many of these young Humboldtians who return to their home countries are offered good academic positions at universities in Africa and have become unofficial ambassadors for AGNES, i.e. ambassadors also for Africa.

- (iii) Promoting Africa as a research destination: sub-Sahara Africa has unique opportunities for study and we have competent researchers to partner with academics from Germany. This is a central message that we promote (not only in Germany, but also in other parts of the world, e.g USA). Africa has quality researchers and we are, therefore, prepared to partner at eye-level with those from the so-called first world countries. AGNES participates in the Annual Meeting of AvH in Berlin, where we hold workshops to inform Germans and other scholars in Germany about the possibilities in Africa to do excellent and exciting research. In addition (as mentioned above), German scholars are invited to attend conferences in Africa. The AvH has a specific funding programme for German postdoc fellowships to study abroad, hence this is a good way to attract other good minds to our region.

- (iv) Participation in ongoing discourse on expansion of scientific and academic capacities: this is a very relevant point on the African continent with our increasing need for providing more institutes of higher education for the increasing population, but also the resources that are required for research endeavours. AGNES has welcomed the opportunities to discuss these issues at various fora and with different funding bodies, including participative involvement of African members into German policy-making w.r.t. funding/plans for development in Africa ,e.g. a draft version of the so-called “Marshall Plan with Africa” that was recently published in the context of the “Afrikajahr in Deutschland 2017” (“Africa Year in Germany 2017) [5]

Discussion

For the sake of brevity, discussion points will be limited to the value and innovative aspects of the postgraduate Mobility programme, followed by specific recommendations.

- (1) Students choose the scientific host located anywhere within sub-Sahara Africa (outside of their country of registration): students are not constrained to collaborate only with specific

countries or Institutions that fall under a Memorandum of Understanding/Institutional agreement. They may go wherever the expertise is best. This allows for greater diversity of collaborations in Africa. From student feedback it is also clear that they value the intra-Africa experience because they have a glimpse into the life and culture of other African. The interaction dispels preconceived notions of foreigners, and shows them the potential of doing meaningful research in Africa – not in isolation but in collaboration. This is important to curb the brain drain – the loss of talented young academics to developed countries. Every highly skilled individual that remains to work in Africa is a benefit to the entire continent.

- (2) Short but intensive period abroad: students are not abroad for the entire degree; this is beneficial for productivity since a limited time-frame translates to an increased focus on the goals of the research visit by student and host alike. The short period eliminates emotional distractedness (no home-sickness). Part-time students, e.g. those who hold lectureships, may also participate and benefit from the programme – 1 to 2 months of Leave of Absence in exchange for intensive research, data analyses or preparing a manuscript is not an unreasonable request.
- (3) Language fluency is near-negligible on a short visit: usually, co-operation is between countries that speak the same languages (English or French in the African context). We found that students are prepared to visit countries where they are not fluent in the language. The Francophone student and host supervisor especially appreciated the practice with English.
- (4) Active scientific collaboration is ensured beyond the initial visit: because the research proposal for the short stay is approved by both the home supervisor and the host, this is the first step of a collaborative effort between two groups in different countries on the continent. The home institutions usually lack the required research infrastructure for a specific aspect of the student project, and since this not likely to change in the immediate future, the short-stay collaboration could evolve into a constant co-operation between the groups to broaden the scope of the projects on offer at the home institute, while the host could benefit from joint publications. Furthermore, such collaborations inevitably result in quality control of research proposals, data analyses and manuscripts (or dissertations or theses). AGNES
- (5) Grantees are sensitized to excellence and opportunities beyond the current degree: we disseminate information on funding for postdoc opportunities in Germany, particularly since there is a return fellowship involved that encourages the postdocs to return to their home to plough their skills back into local communities. The grantees are encouraged to network and publish research data in peer-reviewed journals and not in pay-to-publish predatory journals.

Recommendations/Lessons learnt

- (1) Upscale the mobility opportunity: there *is* a need for comprehensive student funding for short research visits in Africa (over 300 students have applied in 2017 for this Grant). More funds are required to enable more students to benefit. Note that we also give a research allowance to the host to cover bench fees or some consumables – it is important to acknowledge the host financially.
- (2) Broadcast grant opportunities in a manner that it will reach the students: it is unfortunate that many established academics do not disseminate student funding information, or only to a select few. We make use of “word of mouth” by sending Calls to previous Grantees. They want to share their successes with their peers and so pass on the information readily – it works! In 2016 over a 100 student applied; in contrast, when academic staff members were asked to nominate postdocs, only 30 nominations were received.

- (3) Established academics must pay attention to the younger ones: postgraduate students need encouragement to pursue academic excellence. Students at the Masters level should already be guided and motivated to prepare their data for publication; this should happen soonest and not wait until graduation. This is very important for Doctoral students where excellent postdoc fellowships are decided on the strength of the publication record. First authorship by the student should be allowed and supervisors must provide assistance with selecting peer-reviewed, international journals for publishing.
- (4) Institutions must provide training to postgraduates on how to best market themselves: our students are in need of workshops on basic issues, such as how to prepare an academic CV, proposal writing, budget compilations, cover letters for applications, etc. Workshops on how to prepare and conduct interviews are also needed.

Concluding comments

AGNES was developed out of a need to increase the visibility of scholarly excellence in sub-Saharan Africa where the ratio of academic to non-academic inhabitant is extremely low, to remind and inspire our communities of what can be achieved and maintained through regional and international scientific collaboration. In addition, the world needs to be reminded that Africa is achieving and retaining excellence. We are striving to seek mutually beneficial partnerships within Africa and with Germany and other regions that agree with the AU Agenda 2063 to attain the Africa we want, for transformation and integration of education and skills in our societies, so that Africa becomes an active and equal global participant.

The main objectives of AGNES were derived from recommendations made by several African alumni of the Humboldt Foundation and were even developed during an annual meeting of the Association of African Universities (2009 AAU meeting, where Humboldt Alumni participated). It was fitting, thus, that a presentation with actual achievements along these lines were made by the 5-year old AGNES at the 50th Jubilee of the AAU!

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