

Research as a Joint Endeavour: The TWAS-DFG Cooperation Visits Programme

Since 2010, the DFG has been working with TWAS, The World Academy of Sciences for the Advancement of Science in Developing Countries, to support research visits of up to three months by postdoctoral researchers from sub-Saharan Africa to Germany in the TWAS-DFG Cooperation Visits Programme. This infobrief presents selected results on the profiles of programme participants and analyses their publication output and collaborative work.

1 Research question

African research systems are experiencing steady growth. Research on the African continent represents an increasing proportion of global scientific publication output (Confraria & Godinho, 2015). Smaller countries, for example Madagascar, Zambia and Benin, tend to have a strong disciplinary specialisation, while larger countries such as South Africa, Nigeria and Tanzania have a broader disciplinary spectrum. There is a special emphasis on the life sciences, particularly immunology and microbiology, making important contributions to areas such as tropical diseases, and on agricultural sciences, with related fields such as environmental science, plant science and zoology.

Since 2010, the DFG has been cooperating with TWAS, The World Academy of Sciences for the Advancement of Science in Developing Countries. Through the TWAS-DFG Cooperation Visits Programme, each year until 2018, the partners will jointly fund 30 research visits of up to three months each by postdoctoral researchers to Germany. This year, it was decided to top up the programme, so up to 50 visits will now be possible each year subject to the qual-

ity of proposals. Participants must be based at a research institution in a sub-Saharan African country and have an invitation from a research institution in Germany. Applications can be made to TWAS up to five years after completing a doctorate. The selection process is carried out by panels of reviewers who are mostly appointed by TWAS. The DFG bears the costs equivalent to the guests' travel and maintenance costs as well as a fixed sum for the costs of the host institution.

Through this partnership, the DFG and TWAS aim to enable German researchers to establish initial contacts with outstanding African postdoctoral researchers and promote longer-term research cooperation. The African guests gain access to Germany's scientific infrastructure and are able to familiarise themselves with the research practices and methods used at the host institutions. In the long term, the aim is to support their integration in the international community of their particular discipline and their research careers in their home countries. This infobrief evaluates the institutional and disciplinary profiles of the programme participants and examines in what collaborative formats they publish before and after funding.

2 Data basis and method

Between the start of the programme in 2010 and the last year examined in this report, 2016, a total of 171 visits were approved in the programme, in each case for the following year. The bibliometric analysis includes researchers who have actually begun their research visit. Eleven participants declined the offer. Accordingly, information on 160 researchers was included in the analysis.

To collect publication statistics, the SCOPUS ID¹ was identified for the 160 individuals on the basis of first and last name (including spelling variants) and, if necessary, research area. Only nine researchers were not listed in SCOPUS. This indicates that the participants' subject spectrum and publication channels are well covered by the database.

For further analysis, two periods were classified. The "before funding" period comprises all publications up to and including the year when the proposal was approved. Since the actual research visit takes place up to a year later, publications arising from research visits should not be expected in the year in which the proposal was approved. The definition "after funding" comprises all years after the year of the funding decision. This makes it possible to assess the researchers' publication output to date and to what extent they have published after the TWAS funding.

The duration of the time periods naturally varies according to cohort: among researchers who were funded in 2010, the "before funding" period includes all years up to and including 2010 and the "after funding" period the years 2011 to 2018. For funding recipients in 2016, the "before funding" period extends up to 2016 and the "after funding decision" period includes only the 18 months from January 2017 to June 2018, when the data collection was conducted.

In addition to publications, the institutions and countries in which funding recipients are currently working were recorded. The search was limited to publicly available information such as university websites and academic portals.

3 Profiles of funding recipients

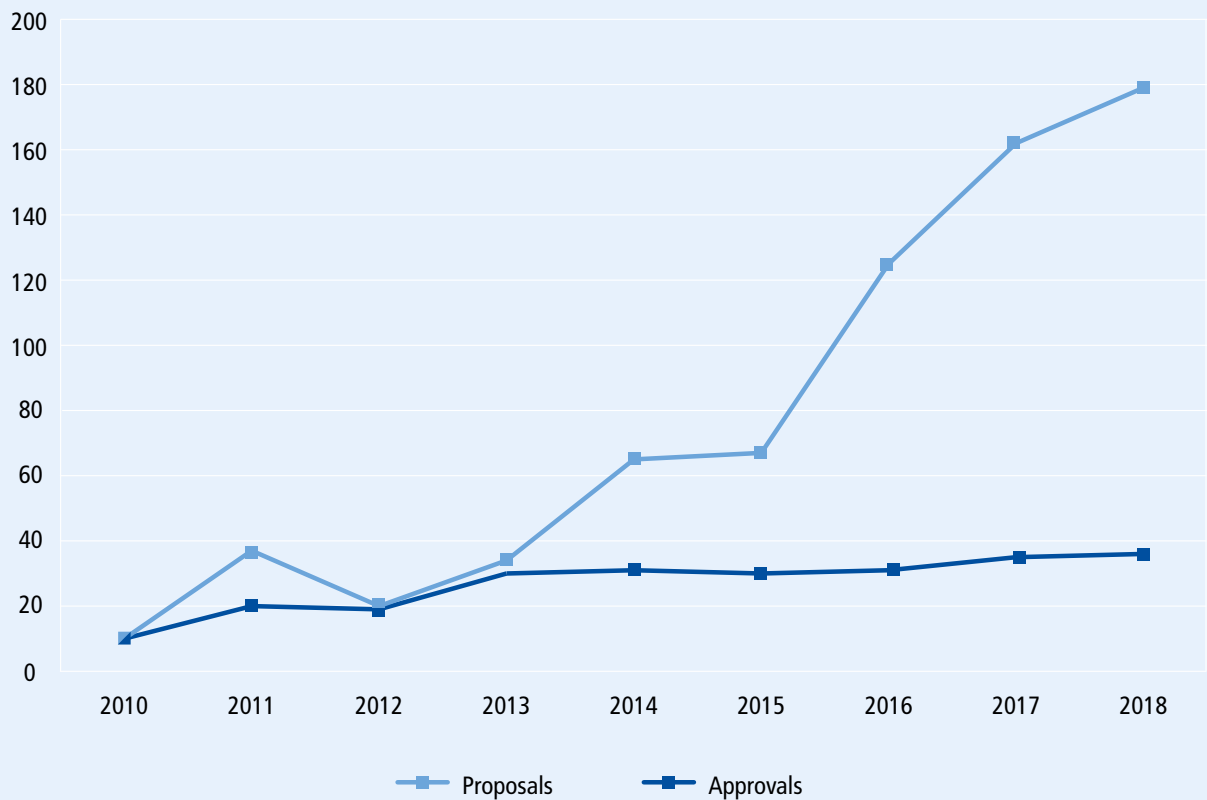
Between 2010 and 2018, a total of 699 proposals were submitted in the TWAS-DFG Cooperation Visits Programme. During this period, 242 proposals were approved (Figure 1). The diagram shows that the number of proposals has risen substantially since the programme was first introduced. Since applicants require an invitation from a German host institution, this trend indicates a growing interest on both sides. It may be assumed that this is due to the fact that since 2015 – as part of the implementation of its Africa concept – the DFG has been directly advertising the programme to African research funding organisations with which it cooperates. This was also the year in which proposals from South Africa began to be invited. Furthermore, the DFG's first issuing of the call for 2018² presumably contributed to a further increase in the number of applicants. The recent top-up of the programme is partly a response to the growing demand for this type of funding. The analyses that follow, as explained in section 2, include the funding recipients for the years 2010 to 2016.

The cooperation programme reflects the focuses of scientific research in Africa. As shown in Figure 2, somewhat more than half of the visiting researchers represent the life sciences. 23 percent of funding recipients work in medicine (37 individuals) and 16 percent each in biology and in agriculture, forestry and veterinary medicine. At around a quarter of all funding recipients (45 individuals), the natural sciences are also well represented: 13 percent work in chemistry, followed by the earth sciences (8 percent), mathematics (4 percent) and physics

¹ In a few cases, more than one SCOPUS ID existed. It has been demonstrated that overall the SCOPUS ID enables the reliable assignment of publications to individuals, even where there are spelling variants and homonyms (Aman, 2017).

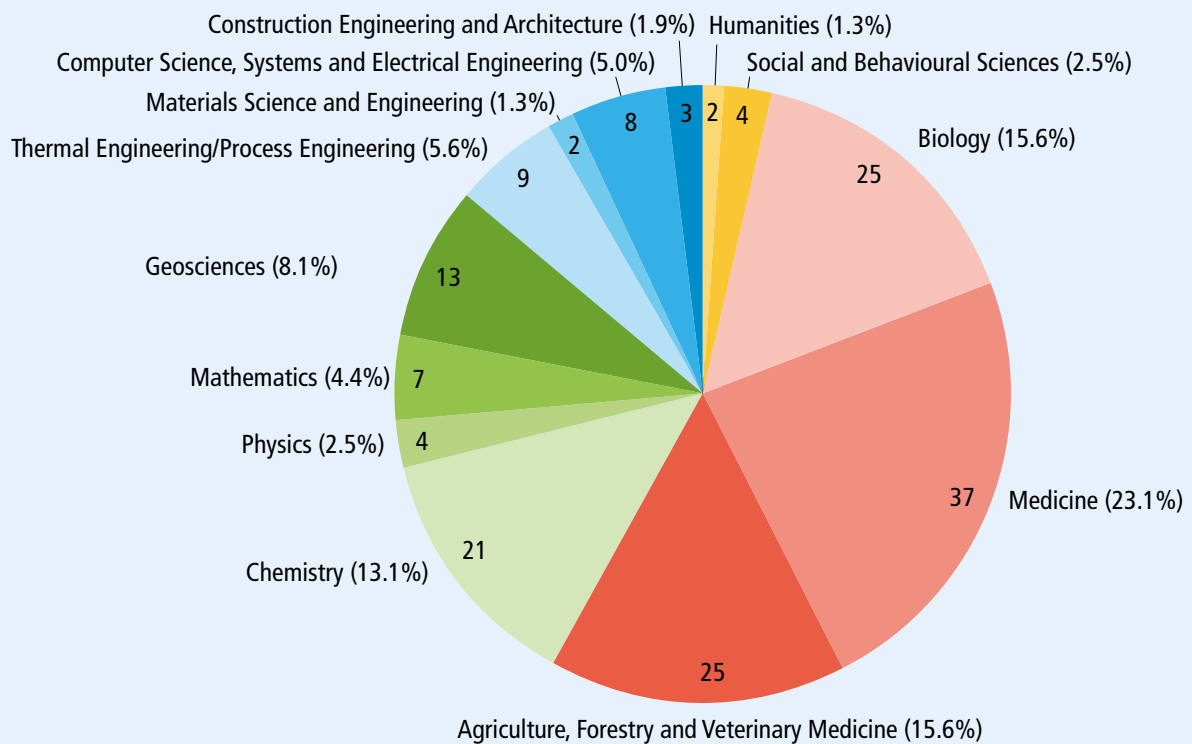
² <https://twas.org/opportunity/twas-dfg-cooperation-visits-programme>

Figure 1:
Proposals and approvals 2010–2018



Data basis and source:
Proposals and approvals recorded by TWAS in approval years 2010–2018. N=699.

Figure 2:
Subject-area composition of funding recipients



Data basis and source:
Proposal documents of approved applicants 2010–2016, N=160.

(3 percent). Only a few recipients represent the engineering sciences (14 percent) and the social sciences and humanities (4 percent).

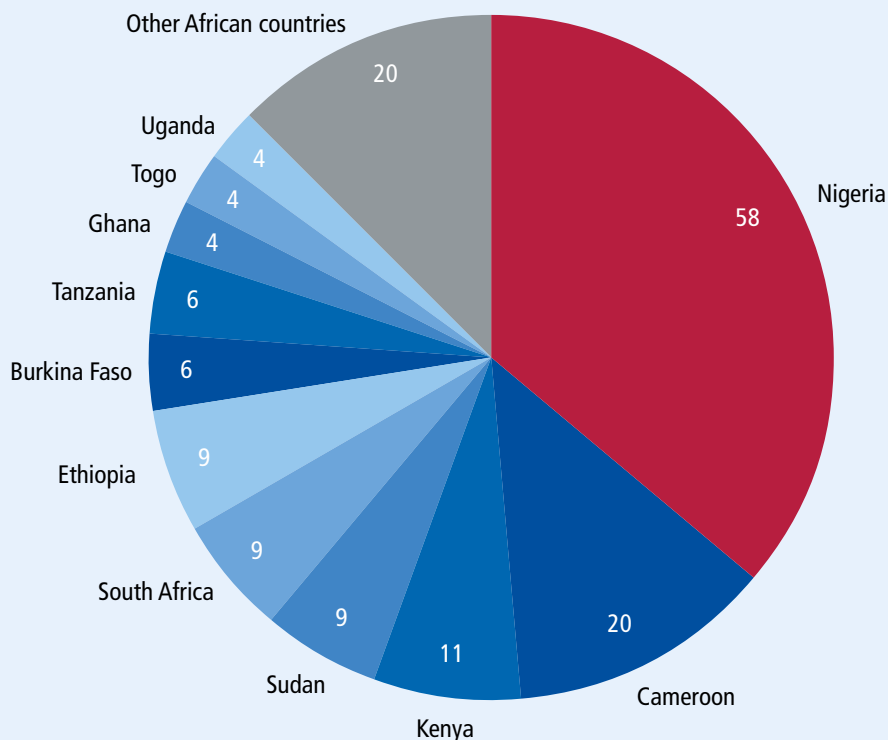
The high diversity of the funding recipients is also reflected in the distribution of countries from which applications were received, although there are some obvious focal areas (Figure 3). A large proportion of applications comes from Nigeria; 58 of the 160 participants (just over 36 percent) were based there when they submitted their applications, followed by 13 percent in Cameroon. 7 percent of funding recipients were based in Kenya and 6 percent each in Sudan, South Africa and Ethiopia. Other countries account for between 1 percent and 4 percent. In the interests of clarity, the countries with 3 proposals or fewer are combined in the diagram.

Applications for a research visit can be submitted to TWAS up to five years after completion of the doctorate; the funding is therefore

designed as postdoctoral funding. For the 160 individuals assessed, the doctorate was completed on average 3.2 years previously. A slight majority of the participants earned their doctorates in their home country (93 out of 160, not shown). 8 percent carried out their doctoral research in another African country, almost without exception in South Africa.³ Overall, 34 percent of participants had already worked in a non-African country for their doctorates before returning home, 21 percent in Europe (including 6 percent in Germany), 8 percent in Asia (mainly China, India and Japan) and a total of 4 percent in the USA, Australia, New Zealand or Latin America. A significant proportion of funding recipients had therefore already relocated abroad for their doctoral research.

³ Since applications from South Africa were only admitted in 2015 (year of approval), the proportion of participants of South African nationality stands at only a few percent.

Figure 3:
Country in which recipients were located when the proposal was submitted



Data basis and source:
Proposal documents of approved applicants 2010–2016, N=160.

4 Publications before and after funding

Most funding recipients in the TWAS programme have successfully published. Table 1 shows a breakdown of visiting researchers by the number of publications in the period prior to TWAS funding. For only 5 out of the 160 individuals were no publications found in this period; another 9 were not listed in SCOPUS. The largest number (41 percent) had between 1 and 5 publications, followed by 21 percent with 11 to 20 publications. 18 visiting researchers had a large publication output, with more than 20 publications prior to their TWAS visit.

For further analysis, a distinction was made between publications with the host institution, publications with other institutions in Germany, and publications without any German participation. Table 2 provides a summary of the

number of publications before and after funding in the TWAS-DFG programme.

The overall proportions of publications with German participation and with the host institution show clearly that after the research visit the cooperation profile of the participants shifts towards the funded collaborations. Before funding, the visiting researchers published a total of 144 papers with German institutions (10 percent of all publications), of which 62 publications were with the later host institution. In the post-funding period up to June 2018, which lasted between 1.5 and 8.5 years depending on the cohort, 206 co-publications with German institutions appeared (20 percent of all publications). 144 papers were published with authors at the host institution. It is unknown whether these publications related to the funded project or subsequent projects.

Table 1:
Visiting researchers by number of publications before funding

Publications before TWAS funding	Number of visiting researchers	Percentage
0	5	3.1%
1 to 5	66	41.3%
6 to 10	28	17.5%
11 to 20	34	21.3%
More as 20	18	11.3%
None listed	9	5.6%
Total	160	100%

Data basis and source:
SCOPUS database, based on search of author ID of funding recipients by the DFG. Approved applicants 2010–2016 (N=160).

Table 2:
Total number of SCOPUS publications by period and institution of co-authors

	Before funding		After funding	
	Number	Percentage	Number	Percentage
Without German participation	1,261	89.8%	795	79.4%
With other German participation	82	5.8%	62	6.2%
With host institution	62	4.4%	144	14.4%
Total	1,405	100%	1,001	100%

Data basis and source:
SCOPUS database, based on search of author ID of funding recipients by the DFG. Approved applicants 2010–2016 (N=160); nine persons not listed in SCOPUS.

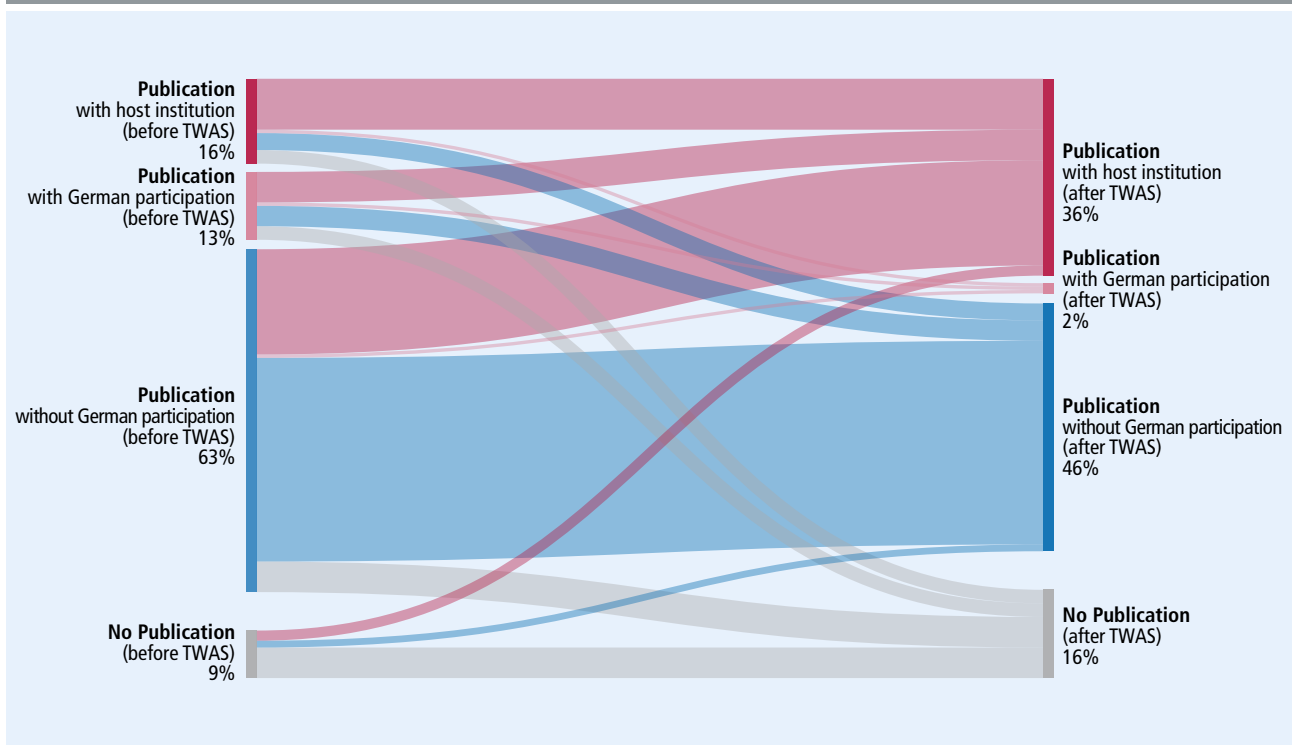
It is also unknown how many of the participants published with the host institution before and after the TWAS-DFG funding. Figure 4 shows not publications but proportions of individuals in a quantity flow diagram. A distinction is made between four groups. One group comprises those participants with publications listed in SCOPUS in the relevant period but with no co-authors in Germany. The second includes those who published co-publications with authors from Germany. The third consists of individuals who authored publications with the institution that later hosted them. The fourth is made up of those with no publications listed in SCOPUS. Also visible in the diagram is the proportion of individuals who switched groups between periods.

The diagram shows that 16 percent of funding recipients published together with the host institution prior to the TWAS-DFG funding. 13 percent of programme participants published papers with other German participation before their research visit. Approximately two

thirds of funding recipients (63 percent) had not published together with co-authors from Germany prior to funding and 9 percent had no publications listed in SCOPUS.

The proportion of individuals who publish with the host institution after funding is noticeably increasing, and they include a large number who have not previously published with the host institution. In the period after TWAS-DFG funding, a total of 58 funding recipients (36 percent) published jointly with the host institution. Of these, just over half (31 individuals) had published without any German participation before funding. 3 out of 14 funding recipients for whom no publications are listed in the period before funding published with the host institution after the TWAS funding. As the cohorts date from different years, in the long term further co-publications may be expected from the more recent cohorts in particular. The number of individuals in the first group may therefore be expected to increase further.

Figure 4:
Number of persons with (co-)publications by institution of co-authors



Data basis and source:

SCOPUS database, based on search of author ID of funding recipients by the DFG. Approved applicants 2010–2016 (N=160).

In which country do funding recipients carry out research today? An analysis of the location of former participants in 2018 reveals that researchers supported through the programme frequently return to their country of origin (country of nationality) (not illustrated). Three out of four participants are now working in their country of origin, with another 8% working in another African country, most commonly South Africa. For 17 percent of former participants (27 individuals), their current location is unknown. Presumably they are no longer working in the research system. Evidently there is no “brain drain” taking place, for example to Europe or North America.

5 Conclusions

The growing number of proposals testifies to the attractiveness of the programme to African researchers. Since proposals can be submitted only with an invitation from Germany, the numbers also show a growing interest among the German hosts. The funding recipients are a diverse group, with an emphasis on the life sciences and on central African countries of origin (Nigeria and Cameroon). The participants’ publication data reveals that the programme has successfully reached the target group of outstanding early career researchers. The majority of them already had publications listed in SCOPUS prior to funding.

During their three-month stays, the visiting researchers were able to intensify existing collaborations and begin new ones. Prior to the visit, 16% of participants had published together with their host institution. Following approval of the proposal, 36% authored at least one publication with the host institution. As this result is based on observation periods of different duration, it may be assumed that the number of individuals with joint publications will continue to increase, particularly among the more recent cohorts.

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