



## **The RUFORUM graduate teaching assistantship programme: Motivation, implementation, accomplishments and future perspectives**

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### **ABSTRACT**

A key gap in the African Agricultural sector is the limited application of science, technology and innovation to support agricultural transformation in the African continent. Among the challenges that the sector faces is low staff capacity particularly at doctoral level, which is widespread across African universities. Despite the efforts made by public and private agencies over the years, African Universities are not able to train a critical number of PhD graduates to strengthen their staff capacities nor staff the national research systems and other agencies, including policy, largely due to limited funding. Yet research has shown that PhD staff have a high ability to generate research outputs and innovations to support development processes. In response to these inadequacies, RUFORUM Vice Chancellors launched the Graduate Teaching Assistantship (GTA) programme in 2014 targeting to train 325 GTAs by 2022 in order to develop staff capacities at PhD level in their universities. It involves a Member University sending its staff to undertake Doctoral training in another RUFORUM Member university, which waives tuition and associated costs. The sending university pays for upkeep of its staff and also research costs. This is envisaged to cut down the cost of PhD training by up to 40% and minimize inbreeding in training in the same university. Therefore, this paper provides an overview on the implementation of GTA programme since its beginning and the extent to which it aligns with the core areas and mandates of RUFORUM while achieving its aims. It also lays out future perspectives for reinforcing the GTA programme and PhD training in RUFORUM member universities. The approach used by the GTA programme implies that the costs of training are covered by the sending and host universities. The sending university provides stipend, travel and research support to candidates while the host university waives tuition and provides accommodation. The GTA candidate provides teaching at the host university while RUFORUM Secretariat facilitates the endorsement of the GTA agreement among the parties. A total of 454 university staffs were nominated for GTA training since 2015. Of these, 133 (total investment of US\$7.98 million by African universities) were placed for training, 289 await placement and sixteen (16) have completed their studies. Out of the 133 under training, 61 are conducting research. Universities in all regions of the continent nominated staff for training under the GTA but only the Eastern, Southern and West Africa regions are hosting GTA nominees for training. Conflict and post-conflict countries have a low numbers of GTA nominees. The number of university female staff under training and awaiting placement is also low. In this regard, the implementation strategy of the GTA needs to remain flexible and be reviewed in order to increase the pool of women scientists and increase participation of disadvantaged groups, especially those from fragile States.

**Key words:** African Universities, Doctoral training, GTA programme, staff development, RUFORUM

## **RÉSUMÉ**

Une déficience clé dans le secteur agricole Africain est l'application limitée de la science, de la technologie et de l'innovation pour soutenir la transformation agricole sur le continent Africain. Parmi les défis auxquels ce secteur est confronté, la faible capacité du personnel, en particulier au niveau du doctorat, est répandue dans les universités africaines. En dépit des efforts déployés par les agences publiques et privées au cours des années, les universités Africaines ne sont pas en mesure de former un nombre critique de doctorants pour renforcer leurs capacités ni de doter en personnel les systèmes nationaux de recherche et autres agences, y compris les politiques, largement à cause du financement limité. Pourtant, la recherche a montré que les personnels avec doctorat ont une grande capacité de générer des résultats de recherche et des innovations pour soutenir les processus de développement. En réponse à ces insuffisances, les Vice-Chanceliers de RUFORUM ont lancé en 2014 le programme d'Assistanat à l'Enseignement Supérieur (GTA) visant à former 325 GTA d'ici 2022 afin de développer les capacités du personnel au niveau du doctorat dans leurs universités. Ce programme implique qu'une université membre envoie son personnel pour suivre une formation doctorale dans une autre université membre de RUFORUM, qui lui dispense des frais académiques et des coûts y associés. L'université d'envoi paie pour les frais d'entretien de son personnel ainsi que les frais de recherche. Ceci est envisagé pour réduire le coût de la formation doctorale jusqu'à 40% et de minimiser la consanguinité de la formation dans la même université. Ainsi, cet article donne un aperçu de la mise en œuvre du programme GTA depuis son introduction et de la mesure dans laquelle il s'aligne avec les principaux domaines et mandats de RUFORUM tout en atteignant ses objectifs. Il présente également les perspectives d'avenir pour renforcer le programme GTA et la formation doctorale dans les universités membres de RUFORUM. L'approche utilisée par le programme GTA implique que les coûts de formation sont couverts par l'université d'envoi et celle d'accueil. L'université d'envoi fournit un salaire ainsi qu'un soutien des frais de voyage et de la recherche aux candidats tandis que l'université d'accueil les dispense des frais académiques et leurs donnent le logement. Le candidat GTA enseigne à l'université d'accueil tandis que RUFORUM secrétariat facilite la signature de l'accord GTA par les parties impliquées. Un total de 454 membres du personnel universitaire ont été nommés pour la formation GTA depuis 2015. De ceux-ci, 133 (investissement total de 7,98 millions de dollars par des universités africaines) ont été placés pour la formation, 289 attendent d'être placés et seize (16) ont terminé leurs études. De ces 133 en formation, 61 sont en train de faire la recherche. Les universités de toutes les régions du continent ont nommé les personnels pour la formation dans le cadre de GTA, mais seules les régions de l'Afrique Orientale, Australe et Occidentale accueillent des candidats GTA pour la formation. Les pays en conflit et ceux en post-conflit ont un faible nombre de candidats GTA nommés. Le nombre du personnel universitaire féminin en formation et en attente d'un placement est également faible. À cet égard, la stratégie de mise en œuvre du GTA doit rester flexible et être révisée afin d'augmenter le nombre de femmes scientifiques et d'accroître la participation des groupes défavorisés, en particulier ceux des États fragiles.

Mots-clés: Universités Africaines, Formation doctorale, Programme GTA, Développement du personnel, RUFORUM

## INTRODUCTION

Agriculture remains the mainstay for many people in the African continent contributing over 15% of its Gross Domestic Product (GDP) and employing two-thirds of the population (Oxford Business Group, 2019). The importance of agriculture in the economic wellbeing of African economies is reflected in its prioritization in development frameworks notably the Comprehensive Africa Agricultural Development Programme (CAADP). Although a gross increase in agricultural production has been reported over the past decades, agricultural productivity has largely stagnated in the continent (OECD-FAO, 2016). A key gap has been the limited application of science, technology and innovation (ST&I) to support agricultural transformation in the African continent (UNCTAD, 2010). The Science Agenda for Agriculture in Africa reinforces the need for Africa to develop its scientific capacity by adapting technologies and innovations that are suited to the local context (FARA, 2014). It is now widely argued that for Africa to take advantage of increased use of science, technology and innovation to support agricultural growth, African countries will have to be very competitive in the knowledge economy (Asongu and Odhiambo, 2019). However, capacity gaps in ST & I remain. The African Capacity Building Foundation in its 2017 Africa Capacity Report reports Africa's very poor performance in ST & I especially in ICT readiness, innovations and staff capacity in deployment of and STI policy making in both public and private agencies (ACBF, 2017). Although Africa's global knowledge footprint is increasing, recent statistics indicate that Africa's contribution to global knowledge remains decimal at only 1% (Nakayiwa *et al.*, 2016).

Higher Education plays a critical role in supplying the requisite knowledge and skills to support agriculture, science, technology and innovation in Africa (Nyerere *et al.*, 2016), however, the sector continues to face

challenges. These include low gross enrolments, limited infrastructure for research and training, mismatch in the skills of the graduates produced and industry requirements, as well as low staff capacity especially at doctoral level (Nakayiwa *et al.*, 2016). The distribution of university teaching staff according to doctoral, master and bachelor's qualifications shows that on average, less than 50% of university staff have doctoral level training in most African countries as shown in Figure 1. Yet PhD staff have a high capacity to generate research outputs and supervise postgraduate students who are able to publish more research knowledge (Okalany *et al.*, 2016). However, due to limited funding, African Universities have not able to train a significant number of PhDs to beef up their staff capacity. Limited capacity to train more PhDs is also hampered by loss of PhD qualified staff due to "brain drain" in search for better working conditions overseas (Tettey, 2006; Okalany *et al.*, 2016).

African universities have tried to overcome challenges of limited public funding through various approaches but mainly by charging students tuition fees (Oketch, 2016). The universities have also embraced diversified funding models to support higher education through competitive grants and project funding to leverage their research and teaching capacity (UNESCO, 2016). Due to increased "massification" of African universities over the years, governments and institutions have tended to favor allocations to teaching and undergraduate training instead of research that is a core part of postgraduate studies and staff development (World Bank, 2010). Some universities have tried to bridge this gap by running staff development programmes that fund their staff to obtain postgraduate training and thereafter get re-absorbed into the university system, but such programmes are absent in many "mushrooming" public and private universities in the continent.



**Figure 1. Share of PhD qualified staff in selected African countries (Source: <https://www.asti.cgiar.org/ag-edu/benchmarking>)**

Recognizing the difficulties in building a strong human resource such as high costs of training abroad, staff shortage in African Universities and high instances of brain drain, the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) introduced Regional masters and doctoral programmes. These programmes served as an alternative means for enhancing staff capacity, research and teaching excellence in African universities. The establishment of regional programmes was based on key recommendations from a thorough needs assessment performed in 2005. RUFORUM identified and strengthened centres of specialization by mounting regional PhD and MSc programmes in key thematic areas aligned to CAADP (Blackie and Woome, 2005). The thematic areas for PhD Regional Programmes included Dryland Resource Management; Soil and Water Resources Management; Food Science and Nutrition; Plant Breeding and Biotechnology; Agricultural and Rural Innovation; Agricultural Resource Economics; and Aquaculture and Fisheries (Njeru, 2014b). On the other hand, regional masters programmes covered the areas of Research

Methods; Plant Breeding and Seed Systems; and Agricultural Information Communication and Management (Njeru, 2014a). Findings from an evaluation study done in 2014 showed that the regional programmes were innovative, demand driven and responsive to the needs of its stakeholders (Njeru, 2014b). Despite the significance of regional programmes in strengthening staff capacity, improving quality of postgraduate teaching and research in host universities, limited funding to support these process has remained a major bottleneck (Okori, 2014).

There is growing interest in building formidable human resources and skills for Africa through higher education by African governments and various development actors. Although many initiatives such as the World Bank African Higher Education Centers of Excellence (ACEs), German Academic Exchange Service (DAAD), and European Union funded Intra-Africa Academic mobility scheme and others have contributed to building the needed human capital for Africa especially at postgraduate level, these efforts are still limited. Wide

human resource gaps still exist in most African universities and countries where most of the staff do not have PhDs (Molla and Cuthbert, 2016). Recognizing the need to develop staff capacities at PhD level among its member universities at a lower cost, RUFORUM launched the Graduate Teaching Assistantship (GTA) programme in 2014 with a target of training 325 GTAs by 2022.

This paper gives an overview of the implementation of the GTA programme since its introduction in 2015 and the extent to which it aligns with the core values and mandates of RUFORUM while achieving its aims. Furthermore, this paper lays out future perspectives for strengthening the GTA programme and PhD training in RUFORUM member universities across the Continent.

**Approach used in the implementation of the Graduate Teaching Assistantship Programme.** The GTA programme has been implemented since 2015 to: (i) improve the quality of higher education and increase the pool of PhD-level trained academic staff in African universities; (ii) provide opportunities for the doctoral research to contribute more directly to African development; (iii) strengthen inter- university collaboration in the field of higher education in Africa; and (iv) promote staff mobility among RUFORUM member universities, and across Africa. Initially, the programme focused only on agriculture and related fields; recently it opened up to more fields based on the gap areas and priorities of member universities. The GTA programme uses a unique approach in which the costs of training are covered by both the sending and host universities. The sending university provides stipend in form of salary for the staff, travel and research support whereas the host university waives tuition and provides accommodation. The GTA candidate also contributes to teaching in the department offering PhD training in the

host university while RUFORUM facilitates the endorsement of the GTA agreement among the involved parties. Full time or part time staff at member universities that have signed the Memorandum of Understanding are the potential candidates to be considered under this arrangement. These candidates are identified by Vice Chancellors of the sending universities.

The GTA programme contributes to one of RUFORUM's three strategic goals to "*build synergy from networks of specialisation to develop quality human resources and capacity required to intensify and increase Africa's agricultural productivity and competitiveness*" and its Vision 2030 Strategy that focuses on building postgraduate (MSc and PhD) training and research capacity in its member universities. The GTA programme also contributes to the aspirations of the African Union Agenda 2063 by building human capital through investments in higher education, science, technology and innovation as well as expansion of postgraduate training as enshrined in the Science, Technology and Innovation Strategy for Africa (STISA-2024).

**Achievements of the GTA Programme, 2015-2020.** The implementation of the GTA programme has responded to increasing the pool of doctoral level trained academic staff in African universities. Since 2015, a total of 454 university staff across the Network have been nominated for training in different fields. Of these, 133 have been successfully placed, while 289 are awaiting placement in different doctoral programmes (Tables 1 and 2) and sixteen have completed their doctoral studies. For the period 2015-2022, the training target was set at 325, meaning that if all the nominated staff were to be placed and trained, the programme would meet and exceed the set target for the period. The high nomination numbers suggest a potential of the GTA programme to contribute effectively to the development of human resources for the

Network universities.

Additionally, the GTA programme has provided opportunities for the doctoral research to contribute more directly to African development. Currently, out of the 133 that are under training across the Continent, 80 are already conducting research. Because this research is being conducted in their home or host institution, it is very likely contributing to solving or mitigating a local or regional problem. The ability to conduct research within the Continent is in contrast to what obtains when the training is done overseas.

The implementation of the GTA programme recognizes and therefore takes advantage of the comparative advantages, specializations and training niches of the RUFORUM Network thus strengthening inter- university collaboration in the field of higher education in Africa. In other words, it operates on the principal of sharing: giving and taking, making the Network truly

“Stronger Together”. It has given opportunities to universities to have human resource capacity built in a total of 13 broad agricultural and non-agricultural fields (Figure 2). The trends indicate a need to pay particular attention to social sciences and ST&I fields, while keeping the focus on capacity building in agriculture.

The GTA programme has brought together the participation and sharing of roles and responsibilities of universities of differing lengths of membership in the Network, ranging from 2 to 16 years (Figure 3A). Further, both ‘young’ and ‘old’ universities with respect to the number of years of their existence, are contributors and beneficiaries of the GTA programme; the range of years of existence of participating members range from less than 10 to over 90 years, although most are younger than 50 years old (Figure 3B). This is an indication that RUFORUM as a Network provides a platform for training quality graduates and for rationalizing resource use

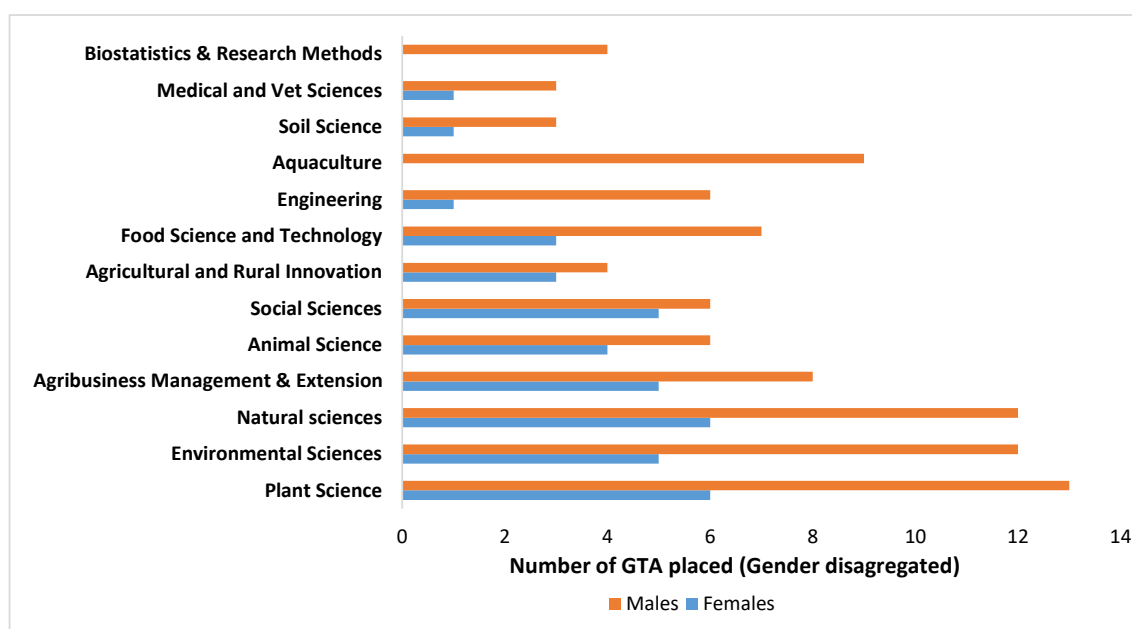


Figure 2. GTA Staff nominated for training in agricultural and non-agricultural fields

for all categories of its members through the GTA programme.

The GTA programme has promoted staff mobility among RUFORUM member universities, and across Africa. The current coverage spans Central, Southern, Eastern, Western and Northern regions of the African continent (Figure 4A). Since 2015, universities in all regions of the continent have been nominating staff for training under the GTA, the Eastern and Southern regions nominating the most (63%) and Central, the least (5%). On the other hand, only three regions, namely Eastern, Southern and Western regions are hosting GTA staff nominees for training. This could be attributed to the differences in the capacity of Universities to train doctoral level students. Again, this confirms the synergistic nature of the programme, allowing universities to fill human capacity gaps in different fields.

The wide span of the GTA implementation is important as it reflects the regionality of the programme. Embedded in this wide span is the participation of Countries of varied stability and socio-economic status. Figure 5 shows the representation of Stable countries (Ghana, Kenya, Malawi, Botswana, Lesotho, eSwatini, Zambia, Uganda, and Namibia); fragile countries (Ethiopia, South Sudan, Zimbabwe, and DRC); Post conflict countries (Liberia, Sierra Leone) and; Conflict countries (Nigeria, Sudan). The low numbers of GTA nominees from conflict and post-conflict countries suggest a need for deliberate inclusion and reach-out to support building and or rebuilding the human capacity of these States using the GTA programme and other available mechanisms.

In an attempt to keeping with RUFORUM's value of promoting a balance in the gender of researchers, faculty and students and increasing the pool of women scientists, the implementation of the GTA programme has targeted inclusion of especially female academic members of staff and staff from fragile States. Currently, 30 and 25% of university staff under training and awaiting placement, respectively, are female. These low percentages suggest the need for stronger affirmative action and more effective equity measures.

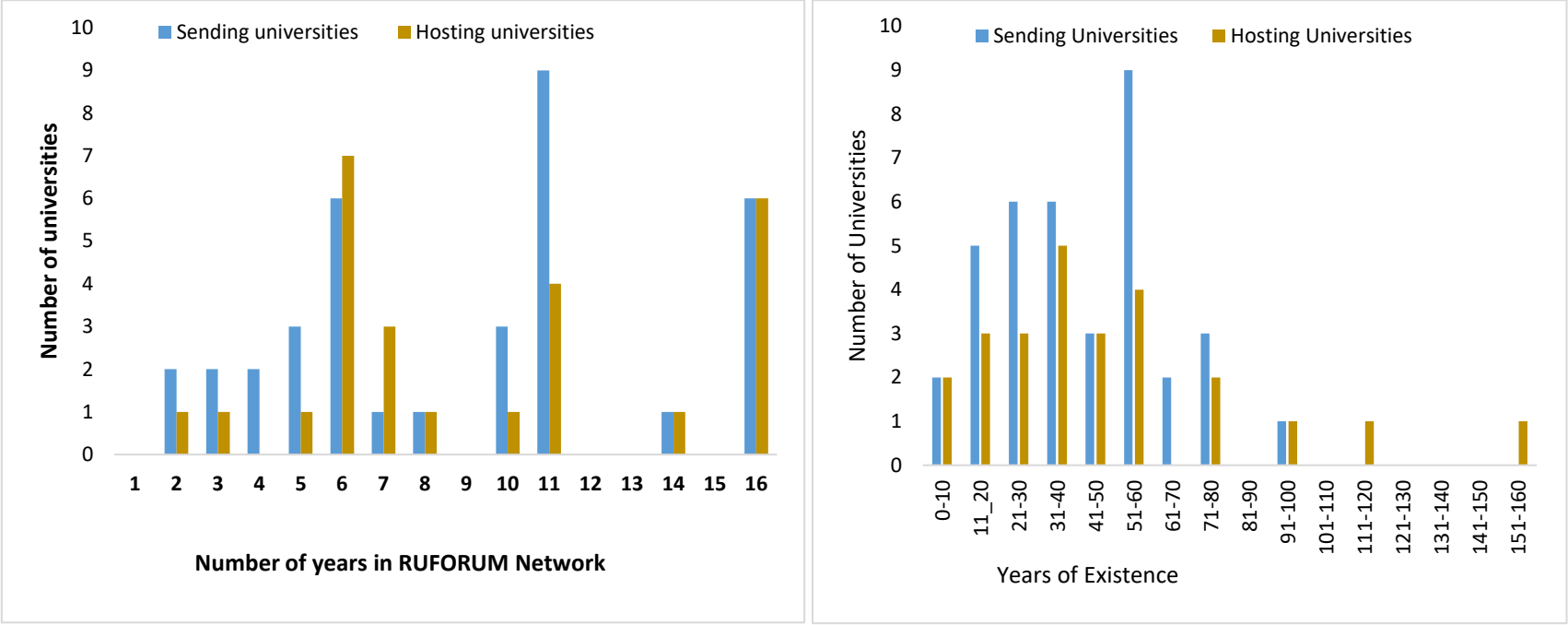
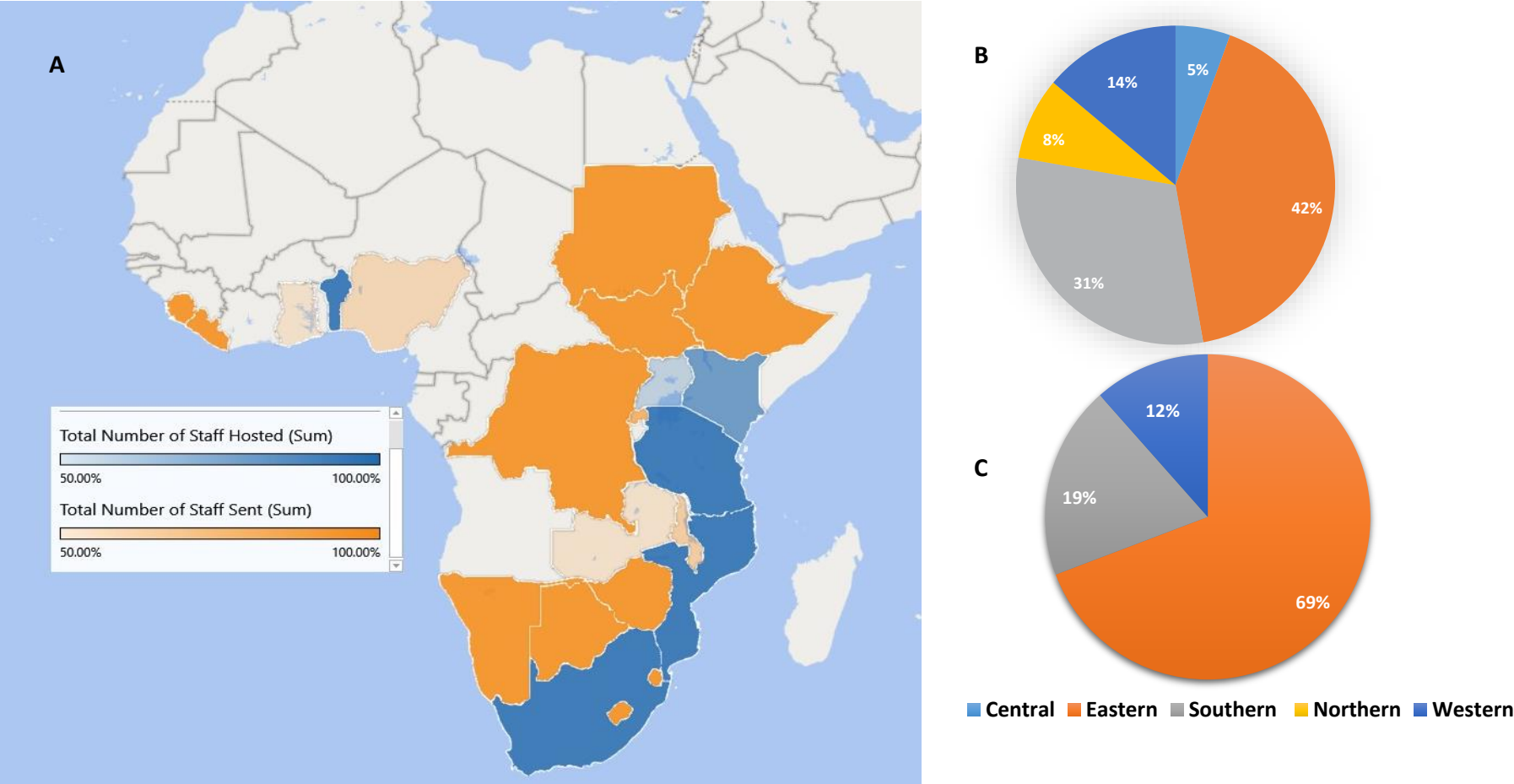


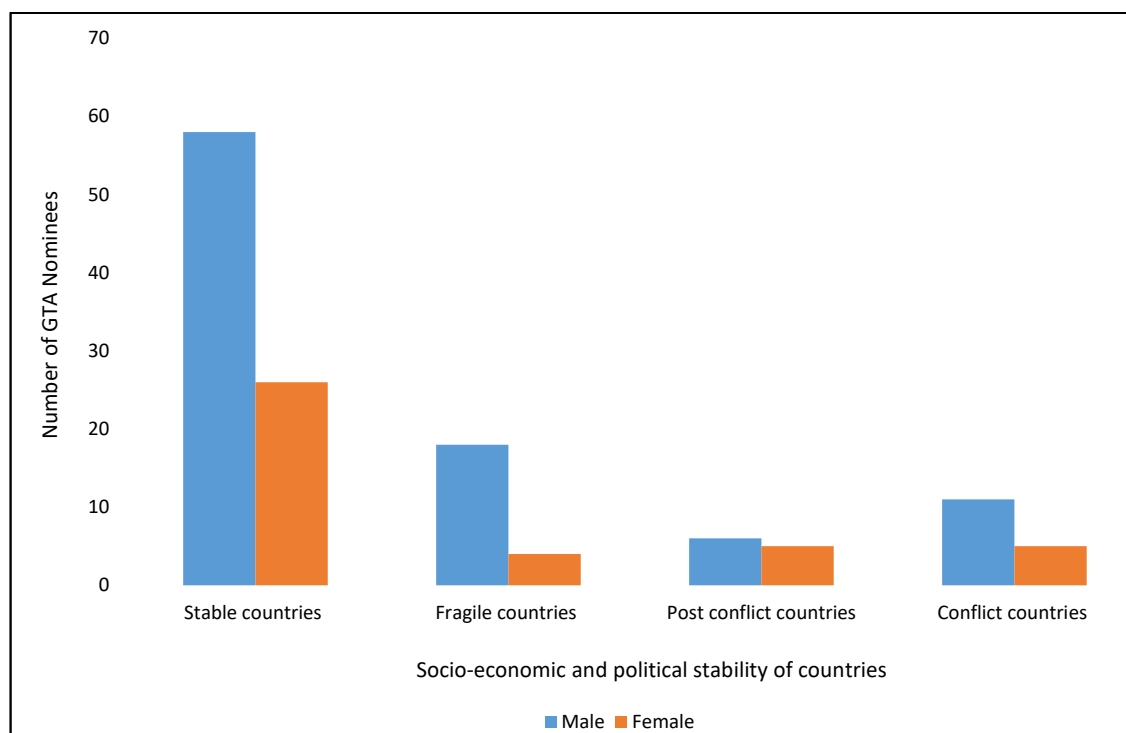
Figure 3. Number of universities participating in GTA according to: A. Years of existence in the RUFORUM network B. Years of existence





**Figure 4. Implementation of GTA Initiative has a Continental Coverage: A. Distribution of GTA Staff Nominations and Placements across the RUFORUM Universities on the African Continent. B. Percentage of Universities sending staff per region C. Percentage of Universities hosting staff per region**





**Figure 5. Implementation of GTA initiative includes Universities from countries of different socio-economic and political stability status.**

In an attempt to keeping with RUFORUM's value of promoting a balance in the gender of researchers, faculty and students and increasing the pool of women scientists, the implementation of the GTA programme has targeted inclusion of especially female academic members of staff and staff from fragile States. Currently, 30 and 25% of university staff under training and awaiting placement, respectively, are female. These low percentages suggest the need for stronger affirmative action and more effective equity measures.

#### CONCLUSION AND RECOMMENDATIONS

Already 133 University academic staff are undertaking training under the GTA arrangement (Table 1), an investment of US\$7.98 million by the African universities. The GTA programme has a lot of potential as a cheaper, Network-wide and Africa-owned instrument of building human resources and university training and research capacities for impact, relevance to the attainment of national, regional, and continental. The GTA programme has potential to contribute to increasing the pool of academic staff with

doctorate degrees supporting research relevant to African development needs, for strengthening collaboration among universities in Africa and promoting staff mobility among RUFORUM member universities and across Africa. In order for all these to be effectively achieved, there is a need for the GTA programme to remain flexible and responsive to the Network-wide needs necessitating changes in its implementation. Further, the implementation of the GTA programme needs to urgently respond to the need to increase the pool of women scientists and university leaders, and of disadvantaged groups.

In addition, talented people attached to particular departments in the Universities and reserved for appointment as members of staff (Staff Development Fellows) and other similar categories should be deliberately targeted. These have previously been left out. This will require reviewing the implementation strategy through consultations among different key players at the University and Network level.

**Table 1. Number of GTA students under training from the different African countries 2015-2020**

Country	Sending		Gender		Hosting		Gender	
	<i>Number of Universities Sending</i>	<i>Total Number of Staff Sent</i>	<i>Number of Male Staff Sent</i>	<i>Number of Female Staff</i>	<i>Number of Host Universities</i>	<i>Total Number of Staff Hosted</i>	<i>Number of Male Staff Hosted</i>	<i>Number of Female Staff Hosted</i>
DRC	2	16	13	3	0	0	0	0
Ethiopia	1	1	1	0	0	0	0	0
Ghana	1	4	4	0	1	4	1	3
Kenya	5	11	10	1	7	49	32	17
Liberia	1	7	3	4	0	0	0	0
Malawi	4	19	14	5	1	13	11	2
Namibia	1	2	1	1	0	0	0	0
Nigeria	3	8	5	3	1	7	6	1
Rwanda	1	7	7	0	1	2	2	0
Lesotho	1	1	1	0	0	0	0	0
South Sudan	1	4	4	0	0	0	0	0
Sudan	2	7	5	2	0	0	0	0
Uganda	8	35	21	14	7	38	25	13
Zimbabwe	2	2	1	1	0	0	0	0
Botswana	1	3	0	3	0	0	0	0
Sierra Leone	1	4	3	1	0	0	0	0
Swaziland	1	1	0	1	0	0	0	0
Benin	0	0	0	0	1	3	3	0
Mozambique	0	0	0	0	1	3	3	0
Tanzania	0	0	0	0	1	3	3	0
South Africa	0	0	0	0	3	9	6	3
Zambia	1	1	0	1	1	2	1	1
Total	37	133	93	40	25	133	93	40

**Table 2. Number of GTA nominees from RUFORUM member universities awaiting placement as of 2020**

Country	Sending		Gender	
	<i>Number of Universities Sending</i>	<i>Total Number of Staff Sent</i>	<i>Number of Male Staff</i>	<i>Number of Female Staff</i>
DRC	2	26	22	4
Ethiopia	0	0	0	0
Ghana	1	6	5	1
Kenya	3	32	25	7
Liberia	1	21	18	3
Malawi	4	25	19	6
Namibia	1	11	9	2
Nigeria	3	17	11	6
Rwanda	1	2	1	1
Lesotho	0	0	0	0
Sudan	3	9	8	1
Uganda	8	81	51	30
Zimbabwe	1	6	4	2
Benin	1	1	0	1
Mozambique	3	28	24	4
Tanzania	1	4	3	1
South Africa	0	0	0	0
Botswana	1	4	3	1
Sierra Leone	1	16	14	2
Zambia	0	0	0	0
Total	35	289	217	72

## ACKNOWLEDGEMENT

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## STATEMENT OF NO-CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this paper.

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