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**To cite this article:** Tom Peter Migun Ogada, Kevin Okoth Ouko, Agnes Lutomiah, Nicholas Odongo, Eric Magale, Caroline Mbaya, Eunice Omwoyo, Clarisse Mideva, Joel Onyango, Samwel Oyugi, Cynthia K. Orang'o, Boniface Nyagah & Everlyn Nguku (21 May 2026): Exploring post-graduation outcomes, employment trends, and career trajectories of PhD graduates in Sub-Saharan Africa: Evidence from Kenya, Ethiopia and Rwanda, Higher Education Research & Development, DOI: [10.1080/07294360.2026.2670669](https://doi.org/10.1080/07294360.2026.2670669)

**To link to this article:** <https://doi.org/10.1080/07294360.2026.2670669>



Published online: 21 May 2026.



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# Exploring post-graduation outcomes, employment trends, and career trajectories of PhD graduates in Sub-Saharan Africa: Evidence from Kenya, Ethiopia and Rwanda

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## ABSTRACT

Doctoral education in Sub-Saharan Africa has expanded rapidly, yet evidence on post-PhD career trajectories remains limited. This study examines employment outcomes, career pathways, and structural constraints shaping doctoral graduates' experiences in Kenya, Ethiopia, and Rwanda. Using a mixed-methods design, the study integrates survey data ( $n = 154$ ), key informant interviews ( $n = 27$ ), and multi-stakeholder policy dialogues under the Regional Scholarship and Innovation Fund. Guided by identity-trajectory theory and academic precarity, the analysis explores how individual aspirations intersect with institutional conditions and broader structural dynamics. Findings show that while career advancement and research engagement motivate doctoral training, graduates navigate fragmented and uncertain career pathways. Academic employment is often characterized by low remuneration, limited research funding, and weak institutional support, prompting engagement in consultancy and externally funded projects. Policy dialogues highlight systemic gaps, including weak research ecosystems, limited industry linkages, and the absence of structured postdoctoral pathways. Alignment between doctoral training and employment is stronger in Kenya and Rwanda than in Ethiopia. The study demonstrates that doctoral career trajectories are shaped by interactions across micro, meso, and macro levels, providing comparative evidence and policy-relevant insights for strengthening doctoral training, research systems, and sustainable academic careers in Sub-Saharan Africa.

## ARTICLE HISTORY

Received 26 August 2025  
Accepted 27 April 2026

## KEYWORDS

Doctoral training;  
postdoctoral training; PhD  
graduates; post-PhD career;  
Sub-Saharan Africa

## 1. Introduction

Despite rapid expansion over the past two decades, doctoral education systems in Sub-Saharan Africa are not consistently translating into stable and sustainable career pathways for PhD graduates (Hlatshwayo, 2024; Moyo, 2022; Pillay, 2015).

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Governments and regional initiatives have increasingly prioritised doctoral training as a means of building advanced human capital, strengthening research capacity, and supporting national development agendas, particularly in science, engineering, and technology fields (Beaudry et al., 2018; Puplampu et al., 2022). However, the outcomes of these investments remain uneven and insufficiently understood, especially with regard to graduates' employment trajectories and long-term career progression.

These challenges reflect broader structural constraints within higher education systems across the region, including limited research funding, inadequate infrastructure, and shortages of qualified academic staff (Beaudry et al., 2018; Pillay, 2015; Puplampu et al., 2022). In countries such as Kenya, persistent academic staff shortages, heavy teaching workloads, and recurring industrial actions illustrate systemic pressures that shape both doctoral training environments and post-graduation opportunities. Under-resourced academic systems also contribute to the outward and intra-regional mobility of highly skilled graduates, reinforcing patterns of brain drain and constraining the development of local research capacity (Berman et al., 2008; Hayward & Ncayiyana, 2014; Moyo, 2022).

Within this context, the concept of academic precarity provides a critical lens for understanding the career trajectories of doctoral graduates. Standing (2014) characterises the emergence of a 'precariat' class marked by insecure, temporary, and fragmented employment. In higher education, this is reflected in the growing reliance on short-term contracts, postdoctoral positions, adjunct teaching, and consultancy work, particularly among early-career researchers (Hlatshwayo, 2024; Izharuddin, 2018; Vatansever, 2023). In many African contexts, these conditions are further compounded by limited institutional resources, low remuneration, and practices such as 'moonlighting' among academic staff (Pillay, 2015). As a result, doctoral graduates often navigate uncertain and hybrid career pathways, raising important questions about the sustainability and inclusiveness of doctoral education systems in the region.

Doctoral training in this study is conceptualised as a holistic process encompassing structured coursework, supervised research, skills development, research collaboration, and professional socialisation within academic and non-academic environments (Cuschieri & Cuschieri, 2021; McAlpine et al., 2013). This framing recognises that doctoral education extends beyond the production of a thesis to include the development of transferable skills, research competencies, and career readiness, all of which are critical in shaping graduates' ability to navigate increasingly complex and constrained labour markets.

While doctoral training equips graduates with advanced analytical, research, and problem-solving skills, enabling diverse career pathways across academia, government, industry, and development sectors (Cuschieri & Cuschieri, 2021; McAlpine et al., 2013; Schoole, 2011), the alignment between doctoral training and labour market demands remains uneven. Although traditional academic careers continue to be valued, opportunities within universities are often limited, prompting graduates to pursue alternative or hybrid roles in policy, innovation systems, and knowledge brokerage (Madan, 2024; McAlpine et al., 2013). The extent to which doctoral training systems adequately prepare graduates for these evolving pathways remains an open question, particularly in resource-constrained environments.

Despite growing global scholarship on doctoral education and career trajectories, empirical evidence from Sub-Saharan Africa remains limited (Hlatshwayo, 2024; Mcalpine et al., 2022; Moyo, 2022). Existing studies are largely concentrated in the Global North, with insufficient attention to how institutional constraints, labour market conditions, and national policy environments shape doctoral training experiences and post-graduation outcomes in African contexts. This gap restricts understanding of how doctoral graduates navigate employment pathways and the challenges and opportunities that influence their career progression.

This study addresses these gaps through a comparative analysis of post-PhD outcomes in Kenya, Ethiopia, and Rwanda. It draws on data from the Regional Scholarship and Innovation Fund (RSIF), a flagship initiative under the Partnership for Skills in Applied Sciences, Engineering and Technology (PASET), which supports doctoral training across a network of African universities. By focusing on RSIF-supported programmes, the study provides a unique multi-country perspective on doctoral training and career trajectories within a coordinated regional framework.

The selection of Kenya, Ethiopia, and Rwanda is informed by both their participation in RSIF and their contrasting higher education systems. Kenya represents a relatively mature and diversified university sector with expanding doctoral enrolment; Ethiopia reflects rapid higher education expansion with significant growth in doctoral programmes over the past two decades; while Rwanda illustrates a more centralised and policy-driven approach to strengthening graduate education and research training. This combination of shared participation in a regional initiative and differing national contexts provides a valuable comparative setting for examining how institutional environments shape doctoral training processes and post-graduation outcomes.

The study makes three key contributions. First, it extends existing scholarship by providing comparative empirical evidence on doctoral career trajectories in Sub-Saharan Africa. Second, it offers novel insights through the use of RSIF data, enabling analysis across multiple national contexts within a coordinated training framework. Third, it advances theoretical understanding by applying the lens of academic precarity to Global South contexts, highlighting how structural constraints and labour market dynamics intersect to shape doctoral graduates' career pathways.

Drawing on a mixed-methods approach, including surveys, key informant interviews, and stakeholder engagements, the study examines employment outcomes, career trajectories, and the structural factors influencing post-PhD experiences in Kenya, Ethiopia, and Rwanda.

Specifically, the study is guided by the following research questions: i. What motivates individuals in Kenya, Ethiopia, and Rwanda to pursue doctoral training? ii. What are the employment outcomes and career trajectories of PhD graduates? iii. How do structural and institutional factors shape post-PhD career pathways and decision-making? iv. To what extent does doctoral training align with labour market demands?

By addressing these questions, the study contributes to a deeper understanding of doctoral education outcomes in Sub-Saharan Africa and provides evidence to inform policy and institutional reforms aimed at strengthening doctoral training systems, improving labour market alignment, and enhancing the career prospects of doctoral graduates.

## 2. Literature review

### 2.1. Constructing post-PhD identities

Post-PhD career planning ideally begins at the start of the doctoral journey to enable coherent post-graduation trajectories (Mangematin, 2000). Many candidates enter doctoral programs with preconceived ‘imagined futures’ that reflect both intellectual and professional aspirations (McAlpine et al., 2013). Studies show that doctoral students in the Global North often emphasize personal intellectual and professional growth (Afonja et al., 2021; Skakni, 2018), while counterparts in the Global South frequently cite altruistic motivations such as contributing to their communities, advancing national development, and attaining public recognition (Griffin, 2023). These initial career imaginaries are not static; they evolve over time as PhD students encounter institutional realities, personal circumstances, and labour market constraints (Mangematin, 2000; McAlpine et al., 2014). Early engagement with career possibilities is therefore critical, yet studies show that career preparation is often inadequately integrated into doctoral experiences (McAlpine & Austin, 2018).

The identity-trajectory theory provides a robust framework for understanding how PhD graduates construct their professional identities over time (McAlpine et al., 2014). This theory emphasizes continuity of stable personhood while recognizing ongoing change, where career trajectories are dynamically shaped by interactions between personal circumstances, such as family responsibilities, life goals, and well-being and structural factors including institutional norms, mentorship, and labour market conditions (Jiang et al., 2019; McAlpine et al., 2013; McAlpine et al., 2022; McAlpine et al., 2023). Within this framework, doctoral graduates are not passive recipients of training; they actively negotiate career pathways, reconfiguring their identities in response to evolving personal priorities and contextual constraints (Heinz, 2009).

Integration with academic precarity: Identity-trajectory theory aligns naturally with the concept of academic precarity (Standing, 2014), which situates career uncertainty within broader structural conditions. For African PhD graduates, precarious employment environments characterized by short-term contracts, low remuneration, and limited institutional support, intersect with personal and professional goals, shaping career decisions, mobility, and retention in academia. This integrated lens allows for a nuanced understanding of how individual agency operates within constrained systems, which is particularly relevant for the postdoctoral and early-career landscape in Sub-Saharan Africa.

### 2.2. Challenges for African PhD graduates

Doctoral graduates in Africa face systemic constraints that amplify career precarity and job dissatisfaction (McAlpine & Austin, 2018; Pyhältö et al., 2017; Skakni & McAlpine, 2017; Van der Weijden et al., 2016). Career uncertainty encompasses both occupational and intellectual dimensions: occupational uncertainty arises from limited tenure security and fragmented academic opportunities, while intellectual uncertainty reflects concerns about long-term viability in research and a sense of belonging within academia (Skakni et al., 2019; Wöhrer, 2014). These uncertainties are exacerbated by low institutional

support, heavy teaching workloads, and limited funding for research, which constrain PhD graduates' ability to develop a research niche or pursue stable academic positions.

Evidence from Sub-Saharan Africa underscores the structural dimensions of this precarity. Studies in Kenya, Rwanda, and Uganda indicate that salary, job security, promotion prospects, and working conditions are central sources of dissatisfaction for academics (Bett, 2020; Kyaligonza & Kamagara, 2017; Munyengabe et al., 2016). Overworked faculty often rely on 'moonlighting' and external consultancies, reducing availability for doctoral supervision, research, and career development activities (Ayiro & Sang, 2011; Hayward & Ncayiyana, 2014; Pyhältö et al., 2017). Such constraints contribute to weak research productivity, with Sub-Saharan Africa producing less than 1% of global research output despite accounting for roughly 16% of the global population (Fonn et al., 2018).

Promotion and recognition structures further compound precarity. African universities often emphasize quantity over quality in research outputs, undermining incentives for rigorous scholarship (Beaudry et al., 2018; Kilonzo & Magak, 2013; Mweru, 2010; Pillay, 2015; Puplambu et al., 2022). In addition, insufficient institutional resources, weak inter-university collaboration, and limited university-industry linkages constrain professional development and career progression (Barasa & Omulando, 2018; Beaudry et al., 2018; Herman & Schoole, 2017; Jowi & Mbwette, 2017; Pillay, 2015; Puplambu et al., 2022; Wangenge-Ouma, 2011). Taken together, these factors create structural precarity, which interacts with individual career aspirations to shape post-PhD trajectories.

### **2.3. Opportunities for African PhD graduates**

Despite these challenges, several structural and institutional opportunities enable African PhD graduates to navigate career precarity and advance their professional trajectories. International research collaborations provide access to research funding, laboratory resources, mentorship networks, and professional development opportunities, which strengthen national scientific systems and individual research capabilities (Beaudry et al., 2018; Cerdeira et al., 2023; Müller et al., 2018; Ngongalah et al., 2018; Pillay, 2015; Vieira, 2022).

Mobility also offers opportunities for career development. Cross-border postdoctoral training and fellowships provide avenues to enhance research experience, broaden professional networks, and improve employability (Schoole et al., 2019). Decisions about international mobility reflect a negotiation between personal circumstances (e.g., family commitments) and structural factors, illustrating the relevance of identity-trajectory theory in explaining career decision-making within the context of academic precarity (Skakni et al., 2019).

Policies aimed at encouraging brain circulation highlight mechanisms to retain talent while fostering knowledge transfer. For example, studies of South African doctoral graduates show that the majority return home, while a small fraction remain abroad temporarily, facilitating skill development without permanent brain drain (Cloete et al., 2015; Kahn & Oghenetega, 2021; Van Schalkwyk et al., 2021).

Other opportunities include consultancy and commissioned research, which can supplement incomes and provide professional visibility, although these roles may limit academic freedom and exacerbate competitive pressures in the research landscape

(Izharuddin, 2018; Luukkonen & Thomas, 2016; Pillay, 2015). Government initiatives and regional programs such as South Africa's PhD capacity-building targets or Ethiopia's Homegrown Collaborative PhD Programs further illustrate growing investment in doctoral training and highlight policy efforts to align advanced skills with national development goals (Molla & Cuthbert, 2016; Nega & Kassaye, 2018; NPC, 2011; Sehoole, 2011).

These opportunities illustrate how structural enablers interact with individual agency. While academic precarity constrains career pathways, graduates leverage personal resources, networks, and mobility to construct meaningful identities and trajectories, reflecting the interplay of identity-trajectory theory and structural context.

## **2.4. Gap and conceptual framing**

This review highlights a critical tension in African doctoral education: PhD graduates navigate between structural precarity and individual aspirations. Identity-trajectory theory explains how graduates negotiate personal goals, family responsibilities, and career aspirations over time, while the lens of academic precarity situates these decisions within systemic constraints, including low funding, weak research culture, and limited institutional support.

This study therefore integrates identity-trajectory theory and academic precarity to examine how individual agency and structural factors jointly shape doctoral graduates' career trajectories in Sub-Saharan Africa. This framing directly informs the research questions on motivations for pursuing doctoral training, employment outcomes, structural influences on career decision-making, and alignment with labor market demands.

## **3. Methodology**

### **3.1. Research design**

This study employed a mixed-methods research design to examine post-graduation outcomes, employment trends, and career trajectories of PhD graduates in Kenya, Ethiopia, and Rwanda within the context of the Regional Scholarship and Innovation Fund (RSIF). Mixed-methods approaches enable the integration of quantitative patterns with qualitative insights, thereby supporting a comprehensive analysis of complex career pathways and institutional dynamics (Creswell & Creswell, 2018; Schoonenboom & Johnson, 2017). Given that doctoral career outcomes are shaped by individual motivations, labour market conditions, institutional environments, and policy frameworks, a mixed methods approach provides both breadth and explanatory depth.

A sequential explanatory design was adopted, whereby quantitative survey data were first collected and analyzed to identify patterns in employment outcomes and career trajectories, followed by qualitative inquiry to interpret these patterns and explore underlying structural and institutional factors (Bowen et al., 2017). This design strengthened analytical robustness by enabling triangulation across multiple data sources (Bryman, 2016).

The study further adopted a comparative cross-national design to examine similarities and variations across Kenya, Ethiopia, and Rwanda. Comparative analysis enhances theoretical generalizability and allows for the identification of context-specific labour

market dynamics and policy gaps influencing doctoral career outcomes (King et al., 1994).

In addition to primary data, a desk review of academic literature, national policy frameworks, and institutional reports was conducted to contextualize doctoral training systems, employment landscapes, and postdoctoral policy environments across the three countries.

### ***3.2. Stakeholder mapping and instrument development***

A stakeholder mapping exercise was conducted to identify key actors influencing doctoral training and post-graduation career trajectories. Stakeholder mapping is widely used in policy and institutional research to systematically identify actors within complex systems (Reed et al., 2009). In the context of doctoral career outcomes, relevant stakeholders extend beyond universities to include research institutions, government agencies, funding bodies, private sector employers, and regional innovation actors.

Stakeholder identification was informed by document review, institutional consultations, and engagement with higher education and research actors across the three countries. Key stakeholder groups included doctoral students, PhD graduates, postdoctoral researchers, academic staff, employers, research managers, and policymakers.

Insights from the mapping process informed the development of a structured survey instrument comprising 28 items. The questionnaire captured data on motivations for pursuing doctoral studies, employment status, sector of employment, career trajectories, job satisfaction, research engagement, and perceived constraints to career progression. The instrument included Likert-scale items, multiple-choice questions, and open-ended responses to capture both standardized and nuanced perspectives (Dillman et al., 2014).

The instrument underwent multi-stage validation, including expert review and pilot testing with 15 participants drawn from the target population. This process enhanced clarity, contextual relevance, and cross-country comparability, thereby improving reliability and reducing measurement error.

### ***3.3. Participants and data collection***

A total of 210 surveys were distributed, of which 154 were completed, yielding a 73% response rate. The final sample comprised respondents from Kenya ( $n = 62$ ), Rwanda ( $n = 46$ ), and Ethiopia ( $n = 46$ ). Participants included PhD students, recent graduates, postdoctoral researchers, and academic staff, ensuring representation across different stages of the doctoral career pipeline.

Participants were recruited using purposive and snowball sampling techniques. Purposive sampling ensured inclusion of individuals with direct experience of doctoral training and post-graduation transitions, while snowball sampling facilitated access to wider professional networks (Patton, 2014). Eligibility criteria included current doctoral enrollment, completion of a PhD within the past five years, or involvement in doctoral training and research systems.

The composition of the sample varied across countries. In Kenya, respondents included doctoral students (51.1%), graduates (10.6%), postdoctoral researchers

(4.2%), and academic staff (34.1%). In Ethiopia, respondents were predominantly doctoral students (86.7%) and graduates (13.3%), while in Rwanda the sample included doctoral students (58%), postdoctoral researchers (9%), academic staff (26%), and graduates (7%).

The survey was administered electronically through institutional networks, alumni platforms, and RSIF-related channels, enabling efficient and standardized data collection across geographically dispersed populations (Dillman et al., 2014).

### **3.4. Key informant interviews**

To complement the survey data, twenty-seven key informant interviews were conducted across the three countries (Kenya = 10, Ethiopia = 9, Rwanda = 8). Interviews were semi-structured and focused on career trajectories, employment experiences, institutional constraints, and labour market dynamics affecting PhD graduates.

Participants were selected using purposive and snowball sampling to ensure representation from academia, research institutions, government agencies, and industry. Interviews explored themes such as motivations for pursuing doctoral studies, transitions into employment, job satisfaction, engagement in research and teaching, and barriers to career advancement.

Each interview lasted approximately 45–60 min and was conducted with informed consent. Interviews were recorded, transcribed, and prepared for systematic qualitative analysis. The semi-structured format enabled consistency across cases while allowing flexibility to capture context-specific experiences (Bryman, 2016).

### **3.5. Validation workshops and policy dialogues**

To enhance the credibility and policy relevance of the findings, validation workshops and policy dialogues were conducted in each country. Three virtual validation workshops engaged approximately 120 stakeholders, including PhD students, graduates, academic staff, policymakers, and representatives from research and funding institutions. These workshops served as member-checking mechanisms to verify interpretations and refine emerging findings (Kullman & Chudyk, 2025).

In addition, in-person policy dialogues were convened in each country, bringing together approximately 150 stakeholders from government, academia, industry, and development partners. These dialogues facilitated reflection on the implications of doctoral career outcomes and enabled the co-creation of policy-relevant recommendations to strengthen doctoral training systems and improve graduate employability.

### **3.6. Data analysis**

Quantitative data were analyzed using STATA version 16.0. Descriptive statistics, including frequencies, percentages, and cross-tabulations, were used to examine employment patterns, sectoral distribution, career trajectories, and levels of job satisfaction (White, 2004). Given differences in sample sizes across countries, analysis emphasized proportional distributions to ensure comparability (Bryman, 2016). Qualitative data from interviews and workshops were analyzed using thematic analysis following established

procedures (Braun & Clarke, 2006). Transcripts were coded using NVivo, applying both deductive codes aligned with the research objectives and inductive codes emerging from the data. Key analytical themes included motivations for doctoral study, employment pathways, career satisfaction, institutional constraints, research engagement, and the absence of structured postdoctoral pathways. Country-level analyses were conducted prior to cross-national synthesis to preserve contextual specificity. Integration of quantitative and qualitative findings enabled triangulation and provided deeper insights into the structural and experiential dimensions of doctoral career trajectories.

### **3.7. Ethical considerations**

Participation was voluntary, and all respondents were provided with detailed information regarding the study's purpose, procedures, and use of data. Informed consent was obtained in accordance with established ethical standards (Israel & Hay, 2006). Confidentiality was ensured through anonymization of all data and removal of identifying information. Data were securely stored and used exclusively for research purposes.

### **3.8. Study limitations**

This study has several limitations. First, the sample size and uneven distribution across respondent categories limit the generalizability of findings beyond descriptive insights. Second, reliance on self-reported data may introduce recall and response biases, particularly in relation to career satisfaction and employment experiences. Third, variations in national labour markets and institutional contexts may constrain direct comparability across countries. Nonetheless, the mixed methods design, cross-national comparative framework, triangulation of multiple data sources, and integration of stakeholder validation processes significantly enhance the robustness, credibility, and policy relevance of the findings.

## **4. Findings**

### **4.1. Post-PhD employment outcomes and trajectories**

The findings revealed a trend among PhD graduates toward evolving career interests that prioritize research and consultancy over traditional academic roles. In Ethiopia, the proportion of individuals involved in teaching dropped significantly after earning a PhD (from 44.4% to 20%), while consulting and research emerged as more attractive options (each attracting 30%) from the survey. This shift suggests a growing inclination toward knowledge application and problem-solving beyond conventional academia, with declining interest in government and industry roles (down to 10% each). Similarly, in Kenya, although a large share of PhD holders initially followed the academic path (75% in teaching, 33.3% in research), post-PhD career interests diversified. Research remained dominant (66.7%), but there was a sharp rise in interest in consultancy (62.5%). Teaching interest declined to 25%, and modest gains were observed in government roles (12.5%), while interest in industry remained low (16.7%). This suggests that graduates are increasingly aware of the value of their expertise beyond academia.

In Rwanda, most respondents came from academic and public sector backgrounds prior to their PhD (teaching and research combined, 32%), with fewer from consultancy, industry, or government. Post-PhD career preferences remained strongly tied to research (25%) and teaching (21%), but a meaningful interest also emerged in consultancy (14%) and industry (8%), reflecting a desire to maintain academic ties while exploring other domains. The policy dialogues and KII data for Rwanda further highlighted a mixed picture regarding postdoctoral career navigation among PhD graduates especially uncertainty around career progression.

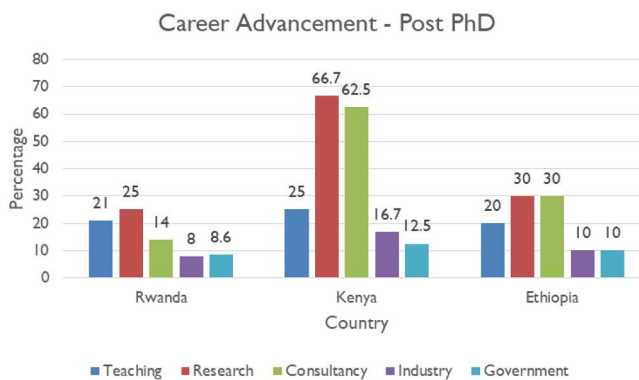
Across all three countries, post-PhD engagement in commissioned research or consultancy is notably high (94.7%), emphasizing a shift toward applied research. These findings suggest that while many PhD holders manage a successful postdoctoral transition, institutional structures and career clarity – especially in contexts like Rwanda – remain critical factors influencing postdoctoral engagement and outcomes (Figure 1).

## 4.2. Micro-level: individual career motivations and decision-making

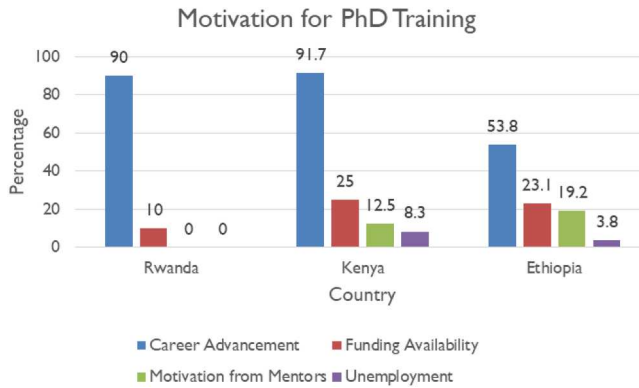
### 4.2.1. Motivation for PhD training

The findings show that across Ethiopia, Kenya and Rwanda, the primary motivation for pursuing PhD studies is career advancement, though secondary motivations vary slightly across the three countries. In Rwanda and Kenya, a striking 90% and 91.7% of respondents respectively cited career progression as their main motivation for enrolling in a PhD program, reflecting a clear and dominant goal of professional growth from the survey. The minority of the respondents in Rwanda (10%) were motivated by funding availability. The Kenyan respondents acknowledged other motivations that include availability of funding opportunities (25%), motivation from mentors (12.5%), and unemployment (8.3%). Similarly, in Ethiopia, career advancement was the leading motivation, cited by 53.8% of respondents. However, motivations were more diversified: 23.1% pursued PhDs due to access to funding, and 19.2% were influenced by mentors. A small minority (3.8%) enrolled due to difficulties in securing employment (Figure 2).

Overall, from the policy dialogues and KIIs, all countries showed that professional development is the primary incentive for doctoral studies, with Ethiopian and Kenyan respondents reflecting a broader range of influencing factors, including mentorship



**Figure 1.** Career advancement – Post PhD.



**Figure 2.** Motivation for PhD training.

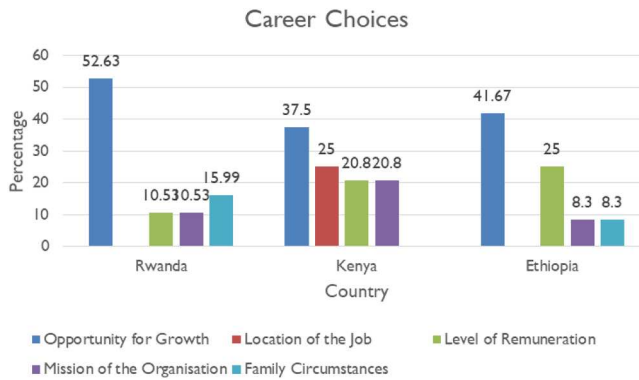
and employment challenges, while Rwandan respondents were more focused on upward career mobility.

#### **4.2.2. Post-PhD career decision-making**

Regarding factors influencing career choices after doctoral studies, the majority of respondents in Kenya (37.5%), Rwanda (52.63%) and Ethiopia (41.67%) identified opportunities for career growth as the most significant determinant from the survey. This was followed by the location of the job, cited by 25% in Kenya, the level of remuneration (20.8% in Kenya and 25% in Ethiopia), the mission of the employing organization (20.8% in Kenya; 10.53% in Rwanda and 8.3% in Ethiopia) and family circumstances, cited by (15.79% in Rwanda and 8.3% in Ethiopia). In Rwanda, several factors each received equal weight as the greatest influence, with 10.53% of respondents identifying level of pay and/or benefits, profile of the organization, mission of the organization, and type of role as their primary considerations. Location of the position was not selected as the greatest influence by any respondent indicating that geographic considerations play a minimal role in post-PhD career decision-making in Rwanda. In contrast, the profile of the organization and the specific roles offered were considered the least influential in Kenya and Ethiopia. These results indicate that the reputation of an organization and the job description alone are not major drivers of career choices in Kenya and Ethiopia (Figure 3).

#### **4.3. Meso-level: alignment of PhD training and expertise to careers**

The online survey respondents revealed contrasting experiences regarding the alignment between PhD training and labor market demands, with significant implications for employability and career satisfaction. In Ethiopia, there is a notable misalignment between PhD training and job market needs. Only 40% of the survey respondents found their training highly relevant to their current roles. This disconnect has led some PhD graduates to shift into non-research fields, indicating underutilization of advanced academic skills and a potential skills mismatch. Conversely, Kenya and



**Figure 3.** Career decision-making influences.

Rwanda demonstrate a strong alignment between doctoral training and the job market. In Kenya, 87.5% of respondents found their PhD studies highly relevant to their current roles, suggesting that the training is well-tailored to employment needs. Similarly, in Rwanda, 85% of respondents reported high utility of their PhD skills in their professional roles, with employment prospects perceived positively. Despite the strong alignment between PhD programs and the academic and research job market, some degree of skills mismatch, leading to low transition to industry and private sector. Informants emphasized a need to upskill PhD graduates with in-demand industry-relevant skills such as project management, communication, and entrepreneurship.

#### **4.4. Macro-level: structural constraints**

##### **4.4.1. Low remuneration**

The KII data and policy dialogue sessions revealed that remuneration and incentives for PhD graduates in academic positions vary significantly across Ethiopia, Kenya, and Rwanda, reflecting broader disparities in national investment in research and higher education. In Ethiopia, academic salaries are among the lowest in the region. University lecturers earn an average of ETB 11,900–14,700 per month (approximately USD 270–350), while full professors earn between ETB 146,200–172,200 annually (about USD 3,500–4,200). The country offers limited formal incentives and small allowances for remote-area postings. Rwanda offers moderate to high academic remuneration for senior staff and postdoctoral researchers. Professors earn between RWF 941,670–1,058,333 per month (approximately USD 820–920). In contrast, Kenya offers relatively competitive academic salaries. Lecturers and assistant professors earn around KES 146,700 per month (roughly USD 1,000–1,200), while full professors can earn up to KES 305,600 (about USD 2,400). In addition to base salaries, academics have allowances for housing, transport, and research, particularly under proposed reforms by the Universities Academic Staff Union (UASU). Many PhD graduates view these salaries as insufficient relative to the years of doctoral training, amount of work and cost of living, pushing academics from academia to other fields like politics and consulting.

#### 4.4.2. Lack of post-doctoral national and institutional frameworks

According to the KII data and policy dialogue sessions, Ethiopia, Kenya and Rwanda and most countries in Sub-Saharan Africa with the exception of South Africa lack national or institutional frameworks or guidelines for managing post-doctoral fellowships at the universities, limiting institutional planning and resource allocation. Frameworks on the roles, responsibilities, eligibility, funding, and expectations lack, inhibiting professional development of postdoctoral fellows and universities' research capacity. Therefore, lack of structured postdoctoral programs at universities in SSA significantly hampers the development of early-career researchers.

The policy dialogues and KIIs indicated that mentorship and training is pivotal to establishing a Post-PhD career. Unfortunately, the availability of mentorship across academic institutions in the three countries were found to be inadequate, with a notable shortage of experienced mentors capable of effectively guiding postdoctoral researchers. This shortcoming exacerbates retention issues within higher education, as emerging scholars may be tempted to explore other careers where mentorship and professional growth are more promising.

The survey results indicate that PhD graduates feel most confident in research (70.8%) and teaching (50%) skills, with less confidence in research supervision (45.8%), non-academic writing (62.5%), science translation (50%), and policy advocacy (41.7%). These findings suggest that doctoral programs are primarily geared toward academic career preparation, effectively building competencies in research and teaching, but offering limited support for developing skills beyond academia. The lower confidence in supervision and non-academic competencies seen in Kenya, Ethiopia and Rwanda highlights a gap in transferable skills essential for leadership roles in policy, industry, and civil society.

#### 4.4.3. A weak research culture

Respondents across Ethiopia, Rwanda, and Kenya identified a shared, systemic challenge: the prevailing attitude of under-valuation of research in these countries as the primary challenge encountered post-PhD that undermines post-PhD career development and national research ecosystems. Respondents consistently identified this undervaluation as the most critical obstacle, followed by concerns related to job dissatisfaction and limited funding. Most countries in SSA's investment in R&D stands at less than 1% of their GDP, falling short of the African Union's target of 1% (Konde, 2018) compared to moderate knowledge economies such as South Korea whose public spending on R&D stands up to 4.5% of their GDP (CUE, 2024). This underinvestment directly impacts the country's ability to innovate and grow, underscoring the need for increased R&D investment and improved coordination across sectors. Moreover, underinvestment constrains innovation and limits research capacity, reflecting a broader lack of prioritization of research in national development strategies.

In Rwanda, while 63.2% of PhD graduates reported to have successfully secured research grants, reflecting competitive capacity in attracting funding, about 36.8% had not received any grants, pointing to persistent barriers in accessing postdoctoral funding opportunities. From the policy dialogues, funding constraints remain a significant challenge in research. At the systemic level, Rwanda's research systems face persistent funding constraints. A limited direct support from the government leads to a heavy reliance on external funders. The findings further revealed that without dedicated

national funding for postdoctoral research, universities rely on external donors, whose funding is often short-term and thematically narrow.

## 5. Discussion

The findings highlight that career advancement is the primary driver of doctoral study in Ethiopia, Kenya, and Rwanda, with graduates seeking financial security and meaningful application of their knowledge and skills. This is in line with findings from previous studies (Brailsford, 2010; Frick et al., 2016; Guerin et al., 2015). African doctoral graduates often underutilize government and private sector pathways due to perceived misalignment with doctoral training, preferring roles that combine relevance, flexibility, and financial reward (Kahn & Oghenetega, 2021; Mhlanga et al., 2025). While academic roles retain intrinsic prestige, they are increasingly unattractive due to low remuneration and limited institutional support, reflecting historical trends in underfunding, low infrastructure quality, and inadequate professional development opportunities (Ayiro & Sang, 2011; Bett, 2020; Fonn et al., 2018; Munyengabe et al., 2016; Wangenge-Ouma, 2011).

Research and consultancy emerge as the preferred post-PhD pathways due to their practical relevance, financial incentives, and flexibility. These roles, however, are not without challenges. Consultancy requires extensive professional networks, which take time to build, limiting opportunities for early-career graduates (Izharuddin, 2018; Luukkonen & Thomas, 2016). Moreover, externally commissioned research can constrain scientific objectivity, though this concern was not a significant issue for graduates in the study. Structural factors such as low public R&D spending, weak institutional support, and lack of postdoctoral frameworks exacerbate career precarity, particularly in Ethiopia, where misalignment between doctoral training and labor market demands is most pronounced. Kenya and Rwanda show stronger alignment, but gaps remain in equipping graduates with transferable skills for industry and policy roles.

At the macro level, low national investment in research, limited mentorship, and weak postdoctoral structures hinder the development of early-career researchers. Addressing these challenges requires multi-level interventions. Governments should increase R&D expenditure to meet AU targets, develop structured postdoctoral frameworks, and foster industry-university linkages to align training with national priorities (Åkerlind, 2005; Barasa & Omulando, 2018; Herman & Schoole, 2017; Jowi & Mbwette, 2017). Institutions should strengthen mentorship programs, integrate transferable skills training into doctoral curricula, and facilitate international collaborations to build research networks and postdoctoral career pathways. Programs like RSIF exemplify successful partnerships that enhance research capacity, mobility, and career progression.

It is therefore clear that SSA doctoral graduates possess high-level expertise and are motivated by career advancement and applied knowledge. Yet structural, institutional, and financial constraints limit their career trajectories. Comprehensive interventions at the micro (individual), meso (institutional), and macro (structural) levels are essential to enhance postdoctoral career outcomes, strengthen national research ecosystems, and support broader development objectives across Sub-Saharan Africa.

## 6. Conclusion

For many doctoral graduates, career advancement remains elusive as they negotiate their post-PhD career. They have to negotiate between precarity and ambiguity in their careers to a viable financially rewarding career, and where their skills and expertise apply. Understanding career outcomes of doctoral graduates, therefore, lends to our commentary on the identity-trajectory theory suggesting career choice weighting against personal considerations and structural factors, international mobility, occupational security and intellectual growth.

Traditional academic roles present precarity despite valuing doctoral training. Employment in government and the private sector offer security but do not align to or value doctoral training, resulting in graduates landing in ambiguous careers. Presently, research and consulting provide the most viable pathway for doctoral graduates in SSA.

Even though governments acknowledge doctoral graduates in driving socio-economic development of the continent. Matching the measures for stemming underemployment requires addressing doctoral graduates being undervalued and overlooked. To arrive at post-PhD outcomes, the government should institute post-doctoral training frameworks, and raise public spending on research and development alongside formulating policy incentives for university-industry linkages.

## Acknowledgments

This research was made possible through the financial support of the Carnegie Corporation of New York (CCNY). We extend our sincere gratitude for their continued commitment to strengthening higher education and research capacity across Africa. The fund was implemented through the Regional Scholarship and Innovation Fund (RSIF) which the flagship program of the Partnership for Skills in Applied Sciences, Engineering and Technology (PASET) under the International Centre of Insect Physiology and Ecology (icipe).

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This work was supported by Carnegie Corporation of New York (CCNY).

## Data availability statement

The data that support the findings of this study are available from the corresponding author, KOO upon reasonable request.


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