African Research Culture - Opinion Research

A report submitted by the
African Population and Health Research Center

Table of Contents

List of tables

List of figures

List of Acronyms

APC	Article Processing Charges
AU	African Union
BMRI	Biomedical Research Institute
CAMES	Conseil Africain et Malgache pour l'Enseignement Superieur[1]
CARIMA	Central African Research and Innovations Management Association
ECR	Early Career Researcher
EARIMA	Eastern African Research and Innovation Management Association
FGDs	Focus Group Discussions
HICs	High-Income Countries
IDIs	In-Depth Interviews
LMICs	Low- and Middle-Income Countries
MCR	Mid-Career Researcher
NARIMA	Northern Africa Research and Innovation Management Association
NGO	Non-Governmental Organisation
NRF	National Research Fund
PIs	Principal Investigators
SR	Senior Researcher
SARIMA	Southern Africa Research and Innovation Management Association
SSA	Sub-Saharan Africa
STEM	Science, Technology, Engineering, and Math
UN	United Nations
WARIMA	West African Research and Innovation Management Association

[1] In English: African and Malagasy Council for Higher Education

Executive Summary

Research culture, which is the environment in which research is carried out, encompasses a combination of the attitudes, values and beliefs of research communities; the structure of the research system and its incentives; and the behaviours and practices of individuals and institutions that are involved in shaping it. The environment in which researchers operate, their attitudes and perceptions, and the governing structures for research determine how researchers engage with and produce research.

Scholars, governments and funders are increasingly interested in fostering a positive and inclusive research culture. However, research culture as defined in high-income countries may not necessarily apply in low- and middle-income countries. It is therefore necessary for the research community to understand and promote what constitutes a positive and inclusive research culture in the African context.

Wellcome seeks to promote positive, inclusive research cultures in its assessment criteria when reviewing proposals for funding. To assist with this, it commissioned an opinion research to examine the *African Research Culture*. The overall objective of this study was to understand what constitutes a "positive and inclusive" research culture in Africa. The specific study objectives were to:

1. Provide an overview of the research culture in Africa;

2. Provide an outline of the research culture in each country within Africa;

3. Determine the drivers of the identified research culture issues; and,

4. Develop a list of recommendations for funders.

This descriptive study utilised a mixed methods approach that employed both qualitative and quantitative data collection tools including online interviews, qualitative interviews and a scoping review. The findings were integrated to inform what African researchers consider the African research culture to be and how this culture is influencing their ability to advance research in institutions across the continent.

A scoping review of 71 articles was conducted to identify common research culture topics in the literature. One hundred researchers from 28 countries representing all African Union sub-regions participated in either an in-depth interview (55) or a focus group discussion (45). Three hundred and four participants from 28 African countries completed the online survey. The survey was available in English, French and Portuguese, although no respondent completed the questionnaire in the latter language. The findings were triangulated with the literature analysed in the scoping review and a few additional sources identified following the scoping review.

The study has 30 key findings. The findings are grouped by the five research questions explored. Key findings for each of the five research questions are presented below.

Key Findings

Positive Research Cultures in Africa

1. Are sufficiently well resourced to allow innovative, ethical research to be conducted.

2. Ensure that outputs and innovations are locally owned and benefit communities where the research is done.

3. Nurture the holistic well-being of the researchers and other workers involved.

4. Have developed and implemented policies that address the historic imbalance between men and women in most countries and institutions.

5. Enable researchers, at all career levels, to publish, communicate and disseminate results in quality journals.

6. Allow for career progression at all levels.

7. Ensure research knowledge is translated to impact policy.

8. Have robust ethical systems that ensure research integrity.

9. Have reasonable funding opportunities from local governments and institutions.

10. Have a support system that assists researchers to cope with personal and professional challenges.

11. Prioritise and address African challenges.

12. Provide platforms for multidisciplinary and participatory research.

13. Have good leadership.

14. Allow for healthy competition.

15. Support healthy work-life balance.

16. Are open to diverse ideas and respect different opinions.

17. Have strong research management associations either at country or regional level.

18. Have strong collaborations (North-South, South-South) that embrace tenets of equal partnerships. Ultimately this is important for securing funding and ensuring that the research team have sufficient skills and experience.

19. Have researchers who can adequately mentor and supervise other researchers to thrive and grow.

Negative Research Cultures in Africa

1. Are not inclusive of some groups, including the disabled or non-English-speaking researchers.

2. Place more emphasis on quantity rather than quality of research products.

3. Have limited funding and opportunities for researchers after PhD and postdoctoral training.

4. Have supervisors and mentors who are unsupportive or unavailable.

5. Have a high level of out-migration, which leads to brain drain.

6. Have poor or limited infrastructure.

7. Lack information on funding opportunities for research.

8. Have power imbalances in collaborations irrespective of whether these are North-South or South-South.

9. Do not provide adequate platforms to report bullying, sexual harassment and other safeguarding issues, hence a culture of silence exists.

10. Overburden researchers with teaching and service delivery at the expense of dedicated research time.

11. Provide limited access to publications, data and information on global conferences and as a result researchers are excluded from the global research ecosystem.

Key Recommendations

The challenges identified influence African research cultures in potentially negative ways. To confront these challenges, this study makes the following recommendations:

1. Institutions and their research leadership should instil an overall empowering mindset within research teams by promoting and using guidelines that promote best practices in team capacity strengthening and inclusivity. This will help improve the power dynamics within all research teams, whether they include researchers from a single institution, a single country or uniting researchers in South-South or South-North research collaborations. If practiced, this will assist in improving the funding arrangements

within research collaborations, the dynamics of the research, and balance the ownership of research outputs – patents, manuscripts, innovations, etc.

2. Address inclusivity issues, beginning with supporting non-English-speaking researchers, disabled researchers, and in some countries women researchers, through targeted policies that have implementation plans and tracking mechanisms.

3. Ensure effective institutional mechanisms are in place so policies are implemented, for example, mechanisms should be put in place to ensure issues of bullying and harassment are effectively addressed.

4. Increase the visibility of African researchers by supporting the development of new and strengthening existing African journals, including the capacity of researchers to review manuscripts effectively, and the indexing of these journals in leading platforms.

5. African governments are advised to fulfil their commitments to increase research funding. This will help reduce the overreliance on external development partners and will allow the continent's researchers to pursue and set national and regional research agendas based on priority challenges.

Areas for Further Research

1. Case studies of core (i.e. research intensive) and periphery (i.e. established this century) universities in at least two countries per African sub-region.

2. A study focused on African research culture in the continent's private sector and industries.

Introduction

Positive, inclusive research cultures are fundamental to ensuring that research professionals work in an environment that allows them to freely explore ideas, make mistakes and learn from them, and share good practices. Wellcome therefore seeks to promote positive, inclusive research cultures in its assessment criteria when reviewing proposals for funding. However, research culture as defined in high-income countries (HICs) may not necessarily apply in low- and middle-income countries (LMICs) and, more specifically, most African countries. It is therefore necessary for Wellcome to understand what constitutes a 'positive and inclusive' research culture in the African context.

The overall objective of this study is to understand what constitutes a positive and inclusive research culture in Africa. The specific study objectives are to:

01 Provide an overview of the research culture in Africa;

02 Provide an outline of the research culture in each country within Africa;

03 Determine the drivers of the identified research culture issues; and,

04 Develop a list of recommendations for funders.

To achieve these objectives, the following research questions were derived:

1. What do African researchers consider a positive research culture to be?

2. What behaviours, values, expectations, attitudes and norms are found in African research communities?

3. What are major issues of inclusion and diversity in African research settings?

4. What are the differences in research management systems in the sub-regions of Africa and how do these impact on the research culture?

5. Are there differences in the research culture of different countries and sub-regions?

Background

Africa's scientific output grew 10% per annum between 2015 and 2019 compared to the global average of 4%. In the 11 areas of science outlined in the 2021 UNESCO Science Report, Africa's share of global publications increased from 0.5% to 1.5%. The continent's overall share of global scientific publications in 2019 was 3.54% (1.8% for the countries of sub-Saharan Africa and 1.74% for the Arab States in Africa). African researchers' greatest share of global publications is 5.9% in agriculture, fisheries and forestry, and the lowest is in physics and astronomy at 2.9% [1].

Researchers' experiences and participation in research careers is determined by the quality of their formal and informal interactions with the scientific community. African countries have a complex research collaboration pattern explained by regional geography, history, culture and language [2]. Support services that facilitate sustainable research (e.g. research management and administration units) are also often inadequate in the African context [3].

It has been estimated that over 10% of sub-Saharan Africans with graduate degrees emigrate to HICs each year [4]. It is therefore important to document researchers' experiences regarding the intersecting factors contributing to the dissatisfaction in research careers on the continent to ensure that appropriate strategies to attract, train and retain Africa's research professionals are developed.

Methodology

This descriptive study used a concurrent mixed methods design with equal dominance [5]. In an equal dominance study, equal weight is given to both the qualitative and quantitative data when answering the research questions. Therefore, an integrative analysis, synthesis and reporting style is used.

Data collection consisted of a scoping review; online survey; in-depth interviews, and focus group discussions. Amref Health Africa in Kenya approved the research protocol – AMREF – ESRC P1259/2022. Data from the scoping review was extracted to an MS Excel spreadsheet to be analysed. Qualitative data from audio-recorded in-depth interviews and focus group discussions was transcribed verbatim, translated into English (where applicable), and transcripts were imported into QSR NVivo 10 for analysis.

Working Definition of Research Culture for This study

For the study, we define research culture using The Royal Society (United Kingdom) definition: "the behaviours, values, expectations, attitudes and norms of our research communities" [6].

Study Area

The area for this study was the African continent, or African region. The African Union (AU) is a continental body that coordinates and intensifies its members efforts to achieve a better life for the peoples of Africa. The AU is composed of 55 members that are divided into five sub-regions: Central Africa; Eastern Africa; Northern Africa, Southern Africa; and Western Africa. The study refers to these five sub-regions.

Study Participants

Four hundred and four individuals from 34 countries participated in the study (Figure 1). All sub-regions of Africa were represented, although North Africa was under-represented compared to the other sub-regions – for details, please see Section 6. Strengths, Limitations and Areas for Further Research. Participants came from varied disciplines including the applied sciences (e.g. biological sciences, physical sciences); health sciences (e.g. medicine, nursing); social sciences (e.g. anthropology, sociology); and science, technology, engineering, and math (STEM).

Scoping Review

Seventy-one articles were reviewed during the scoping review. The data extraction encompassed topics in research culture including workload issues; language of research; gender and/or inclusion; collaboration; supervision and/or mentoring; and funding of research. Other topics included decolonisation; research management and administration support; career progression (e.g. promotion); brain drain and publication trends.

The papers presented in the review represent publications from 16 African countries, namely Botswana, Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Nigeria, Rwanda, Sierra Leone, South Africa, Sudan, Tanzania, Uganda and Zimbabwe. Some papers did not focus on a particular country, but were publications about the African continent, or regions named sub-Saharan Africa, Africa or the WHO Africa Region.

Four topics most frequently addressed by sheer count of papers were funding of research; research collaborations research management and administration support; and supervision and/or mentoring. Workload issues and career progression had a similar level of focus – see Table 1.

Table 1: Coverage of Research Culture Themes in Scoping Review Articles

Operationalization Topic	Percentage of 71 Articles
Funding of research	63%
Collaboration	52%
Research management & administration support	41%
Supervision and/or mentoring	37%
Workload issues	35%
Career progression (e.g. promotion)	34%
Decolonisation	25%
Gender and/or inclusion	17%
Language of research	15%

Figure 1: Map of Participants by Country

Online Survey

An online survey was completed by 304 participants representing 28 countries from all sub-regions of the continent (Figure 2). There were two versions of the survey, a long version with 66 questions and an abridged version with 42 questions. One hundred and sixty respondents identified as male, 139 identified as female, two identified as "other" but did not specify how they identified, and three preferred not to identify their gender.
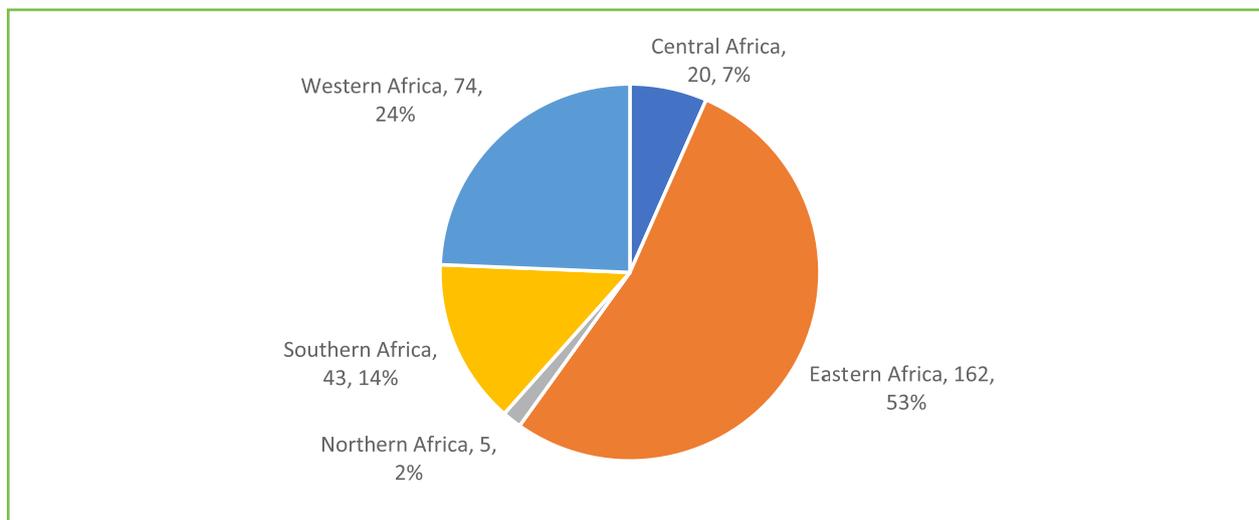
Figure 2: Survey Respondents by African Union Sub-region

In-Depth Interviews & Focus Groups Discussions

Hundred researchers from 28 countries representing all AU sub-regions participated in either an IDI (55) or FGD (45) – see Figure 3. Five FGDs were conducted, one per AU sub-region. The FGDs had between 4 and 13 participants. Sixty-seven IDI/FGD participants responded in English and 33 in French. Sixty-eight percent of the IDI/FGD participants identified as male and 32% as female – this is consistent with the overall distribution of African researchers . Thirty-six percent of IDI/FGD participants were early career researchers (ECR), 31 mid-career researchers (MCR), and 33% senior researchers. The proportion of women and men for each career stage was consistent with the overall participation by gender.

Figure 3: IDI & FGD Participants by AU Sub-region

Findings
Opinions and Perceptions About Research Culture

The findings are presented according to the five broad research questions considered to achieve the specific objectives of the study. Quotes often only refer to the sub-region of the study participant to minimise the risk of attribution. In add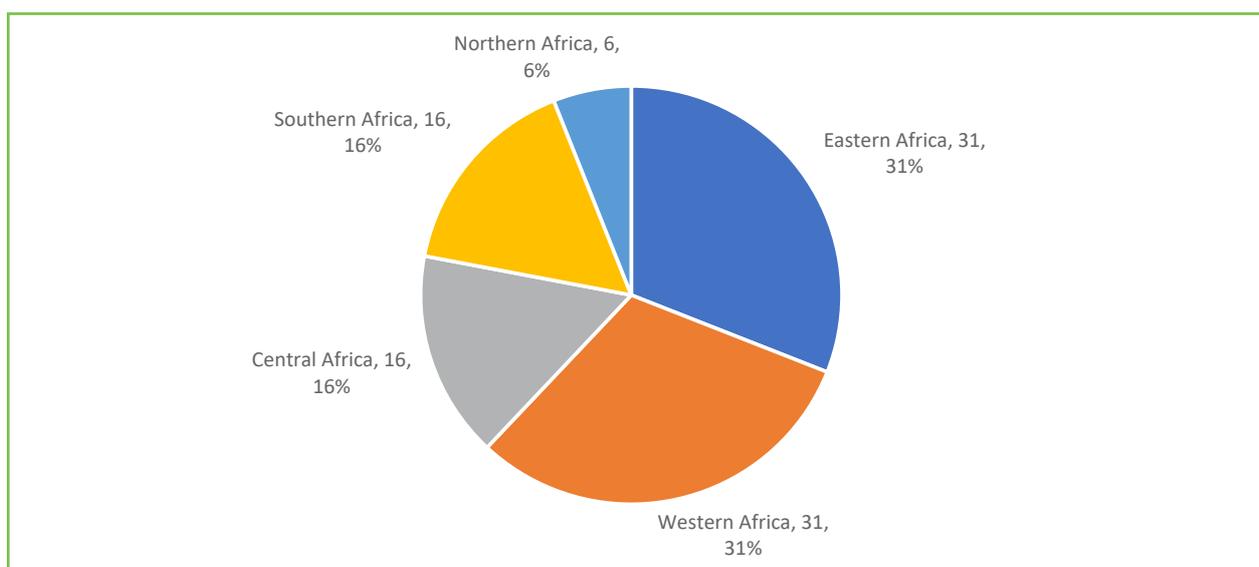ition, a few additional findings from online databases and peer-reviewed and grey literature are presented to complement the study's primary data.

Study participants had a range of perspectives on almost all issues. Differences in perspectives about themes, sub-themes and issues concerning research cultures in Africa are presented.

4.1 What Do African Researchers Consider a Positive Research Culture to Be?

A participant in the Southern Africa FGD provided specific details about the range of characteristics of a positive research culture, stating:

> *What came to my mind was from the behavioural point of view that one would experience supportive management, that there would be an element of openness, freedom, positive energy, collegiality, openness to collaboration, acceptance of diverse opinions, openness to new ideas, encouraging and supportive of youthful emerging scholars, being realistic in the expectations in terms of what is doable …. I think, with regard to performance, with regard to funding, with regard to time management particularly in the learning phases and in terms of values, I was thinking that integrity would be at the heart of a positive research culture, that it embodies ethical practice and that inherent curiosity is allowed to flourish. That is linked back to the freedom of thought and the acceptance of diverse opinions. (ARC_Southern Africa FGD)*

A Central African FGD participant succinctly summarised a positive research culture or environment, by dividing it into two parts, stating:

> *It's when you have an environment that promotes doing (good quality) research not only related to the material aspects but also the psychological i.e. supports the mental and emotional state of the researcher.*

Thus, generally, it may be useful to consider research culture in terms of 1) the material aspects of the research ecosystem, and 2) the mental and emotional aspects of the research ecosystem. Details about frequently mentioned behaviours, values, expectations, attitudes and norms found in African research culture are discussed below.

Researchers Measure Their Success Using an Array of Indicators

As shown in Table 2, publishing research findings was the lead indicator of having a successful career by survey respondents when asked to choose up to five indicators from a list of 13 items. However, other indicators were selected almost as often. Almost all indicators were selected by at least a quarter of the participants. Perspectives varied to a fairly large degree.

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[2]UNESCO reports that women account for 31% of African researchers. See https://www.unesco.org/en/articles/unesco-and-foundation-loreal-recognize-20-young-women-scientists-sub-saharan-africa

Table 2: Ranking of Indicators of a Successful Career as Reported by Survey Respondents

Rank	Item	Percentage
1	Publishing my work through renowned journals or conferences	42.4%
2	Being perceived as an expert in my field	40.8%
3	Access to high-profile projects	37.2%
4	Developing a highly defined skill	35.9%
5	Influence over strategic decisions	33.2%
6	Becoming a mentor	30.9%
7	Securing a strong record of published work	26.6%
8	High degree of autonomy	26.3%
9	Earning recognition from peers	23.7%
10	Promotion to a leadership role	22.7%
11	High salary	22.4%
12	Job security	18.4%
13	Promotion to a management role	8.9%

Aspects That Contribute to a Positive Research Culture

Further to the survey data on indicators of a successful career, IDI and FGD participants identified 15 leading items that contributed to having a positive research culture:

1. Being able to publish, communicate and disseminate results

2. Career progression

3. Being able to translate knowledge so policy is impacted

4. Robust ethical systems and research integrity

5. Funding from government and other institutions

6. Having a support system to assist with coping with personal and professional challenges

7. Research improves or serves the local community. It addresses Africa's challenges

8. Research is participatory and multidisciplinary

9. Good leadership

10. Mentorship is available

11. Ownership of research by local communities

12. Positive pressure and healthy competition

13. A healthy work-life balance is supported

14. Openness to diverse ideas

15. Respectful of different opinions

Expectation | **multiple parties are responsible for driving change in research culture**

When asked who should be responsible for driving change in research culture, survey participants first place votes were almost equally divided among funding bodies at 30%, policymakers (i.e. government) at 30%, and research institutions (e.g. universities) at 26%.

4.2 Findings Regarding Behaviours, Values, Expectations, Attitudes and Norms Found in African Research Communities

Expectation   **publishing is important to institutions and researchers**

Table 3 presents the ranking of what survey respondents perceived their institutions valued most.

Table 3: Aspects Perceived to Be Most Important to Research Institutions

Rank	Activity
1	Publications
2	Collaborations
3	Teaching
4	Public engagement
5	Good management
6	Mentoring
7	Peer-reviewing manuscripts

Researchers in some countries (e.g. Egypt, Mauritius) stated they are beginning to access local funding to cover article processing charges (APCs) so their peer-reviewed publications are open access. Researchers from other countries stated they try to budget for APCs within grant proposals since publishing in what they considered high-impact journals is usually very expensive. Some researchers were not concerned with the journal of publication since impact factor is not considered when their institution scores its researchers. For example, a Nigeria IDI participant stated that their institution's researchers are graded based on having both international and local publications, as well as on the total number of peer-reviewed publications.

Researchers from different countries raised concerns on the common habit of publishing in predatory journals. Some researchers are tempted to submit manuscripts to such journals to meet the publication requirements of their institutions even though APC still apply. A Burkinabè researcher noted that publications is the first criterion used by the CAMES[3] evaluation system used for scoring researchers in Francophone Africa. Specifically, the researcher stated:

> … it's an enormous pressure and researchers at a given moment, instead of favouring quality, are obliged to favour the number of publications. They also fall into the net of predatory journals, because these journals will indicate a very short publication time. (ARC _ BFIDI 01)

Consistent with the perceived importance of publications to institutions, was the feeling by a sizable number of researchers, 36% of survey respondents, that their institutions placed more emphasis on the number versus the quality of publications. Fifty percent of respondents felt that their institution could do more to prevent researchers from producing poor-quality research, 16% disagreed. A Nigerian study participant voiced concern about the focus on quantity over quality, stating:

> When it comes to research, let me put it this way, there is a lot of emphasis on quantity in terms of output and you find out that a lot of people … chase quantity [instead of quality]. [Some are] just trying to push out papers, it doesn't really matter the quality of the papers, you just push them out, get them peer-reviewed as fast as possible and publish them. (NGIDI 04)

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[3] "CAMES coordinates higher education and research systems in Francophone Africa, in order to harmonise higher education and research in Africa. It accredits bachelors, master's and doctoral degrees of higher education institutions in its member countries, and evaluates their lecturer-researchers." See https://www.chea.org/international-directory/conseil-africain-et-malgache-pour-lenseignement-superieur

Norm **culture around research promotes ability to do good-quality research**

Although, as noted above, half of respondents felt their institutions could do more to prevent researchers from producing poor-quality research, a greater percentage, 61%, agreed to some extent that the research culture where they worked promotes the ability to do good-quality research. Seventeen percent did not agree that their institution's research culture promotes the ability to do good-quality research. But while the attitude towards research was generally considered adequately supportive at institutions, as shown below, infrastructure was sometimes lacking.

Norm **infrastructure is sufficient yet remains a barrier to excelling**

The majority of survey respondents, 52%, answered that their work environment provides the necessary infrastructure to conduct their research, although over a third, 36%, disagreed. However, over 91% of survey respondents agreed that limited infrastructure was a barrier to achieving success in research with 71% stating it was a moderate to major barrier. Specifically, an Angolan respondent commented on having access to a laboratory but that it was not sufficiently equipped. A South African respondent noted that electricity disruptions (i.e. load shedding) and internet connectivity were problems.

Norm **although limited infrastructure generally hinders research there are some notable exceptions**

Although, as noted above, a sizable number of survey respondents identified the lack of infrastructure as a major barrier and concern about infrastructure is commonly mentioned in the literature [7, 8], there are some notable examples of improved research infrastructure on the continent. In April 2023, Stellenbosch University officially opened its Biomedical Research Institute (BMRI). The building includes a fully automated biorepository that can store up to five million samples at -80°C. It is the first of its kind in the Southern Hemisphere [9]. In western Kenya, a long-standing collaboration between Moi University, Moi Teaching and Referral Hospital, and a consortium of North American universities has improved both service delivery and research output after making large investments in service and research infrastructure.[4]

Perception **lack of skills is a moderate to major barrier to research**

Sixty-one percent of survey respondents answered that a lack of skills was a moderate to major barrier to research and another 27% perceived it as a minor barrier. Therefore almost 90% of respondents considered the lack of skills to be a research barrier. Research methodology and data analysis skills were noted skills needing further strengthening. These skill shortages were sometimes addressed through collaboration.

Norm **there is a shortage of researchers**

The importance of master's and PhD training, short courses, and learning new skills through collaborations were identified as ways of addressing the skills capacity gap. This capacity gap is further challenged by emigration, although 14% of survey respondents felt that the migration of researchers to other countries positively affected the research culture of their country.

Norm **limited funding for hiring researchers after PhD studies and postdocs**

While there is a fair amount of funding opportunities for PhD studies and postdoctoral training, there is very limited funding for hiring new full-time lecturers and junior professors at institutions. As a result, poor or limited career opportunities and job insecurity are aspects of the research culture at most African institutions.

Norm **supervisors and mentors are unsupportive or unavailable**

Fifty-seven percent of survey respondents reported receiving mentorship when starting their careers. Forty percent of respondents received it every two weeks, 31% received it monthly, 29% received it quarterly, and

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[4]See https://www.ampathkenya.org/research

10% received it annually. The majority, 60%, of respondents received mentorship from someone at their institution and the remaining 40% of mentors were evenly split between representatives from another African institution or an institution from outside Africa.

Most IDI and FGD respondents felt that quality supervision and mentoring were important but some noted that supervisors and mentors were often unavailable or unsupportive, for example,

> *"No, … there is no supervision. It's not like elsewhere (i.e. HICs). There, (there) are postdocs …. … (but here) they don't exist – unless you have a grant and you do the postdoc elsewhere. But in our institution, that doesn't exist. … when the person gets his thesis, he becomes an associate professor, that's all. We give him courses. And then it's up to him to see if he should publish or not, but he's not supervised (or mentored), no, there's no supervision (or mentorship). (ARC _ DRCIDI 04)*

Perhaps most concerning, however, was that 25% of survey respondents were concerned that a senior researcher at their own institution would use a junior researcher's findings without recognition.

Norm | **out-migration (emigration), brain drain**

As shown in Table 4, between 45% and 65% of survey respondents in SSA perceived that out-migration (i.e. emigration) was frequent. Seventy-seven percent of survey respondents who answered the question perceived that out-migration negatively affected the general research culture of their country.

Table 4: Perception of Out-Migration (Emigration) of Researchers by Sub-Region

Sub-region	Percent who responded that emigration was frequent	Number (n) for each sub-region
Central Africa	65.0%	20
Southern Africa	62.8%	43
Western Africa	56.8%	74
Eastern Africa	45.1%	162
Northern Africa	0.0%	5

Norms | **funding is a major challenge and guides African research**

Ninety-five percent of survey respondents identified funding as a barrier to successful research and 86% of all respondents identified it as a "moderate" or "major" barrier. Five percent of survey respondents answered that funding was not a barrier.

IDIs and FGDs participants identified a lack of information about funding opportunities for research as a problem. In addition, funders are often from the HICs in North America and Europe. Furthermore, research funding calls are often in English-only which some Francophone researchers noted challenged them further. In-country funding opportunities are generally few, although this varies widely among African countries.

A majority of survey respondents, 65%, reported conducting consultancies and 35% did not. Consultancies were largely funded by international donors such as the World Bank and agencies of the United Nations (UN). Consultancies were considered important for supplementing low academic salaries but some participants voiced that consultancies and evaluation research dominate the research work available and questioned if this type of research, often implementation research, added value to theory production and schools of thought. In addition, there were concerns that this work may not be relevant to community or country priorities.

Norm collaborations

After publications, healthy collaborations ranked as the second most important driver of a positive research culture. Over two-thirds, 69%, of survey respondents felt that their working environment promotes healthy collaboration and 18% felt it did not.

Research collaborations come in many forms. Collaboration, whether within one's institution, nationally, regionally or with fellow researchers outside Africa was identified as an important aspect of research culture. Outside of one's own institution, non-African partners were the most common collaborators with 76% of survey respondents having such collaborations, followed by 50% who had national collaborations, and 42% who had collaborations with other African researchers from outside their country. Table 5 presents the perspectives of survey participants of positive and negative aspects of collaborations, African vs non-African.

Table 5: Survey Participants' Perspectives on Positive and Negative Aspects of African and Non-African Collaborations

Positive and Negative Aspects of Collaboration	African Collaborations	Non-African Collaborations
Positive Aspects		
Funding is improved through collaboration	38.4%	55.3%
Training opportunities increase with collaboration	40.1%	40.5%
Leads to the development of training facilities/research infrastructure	28.0%	34.2%
Improves research methodology	27.0%	36.9%
New methodologies are learned through collaboration	16.7%	30.0%
More opportunities for trainees are gained through collaboration	28.0%	29.0%
Easier to publish results when collaborating	16.4%	30.3%
Negative Aspects		
Collaboration decreases independence of opinion	28.6%	40.5%
One has less influence on research when collaborating	28.6%	32.6%
Collaboration leads to less relevant research topics being chosen	22.0%	27.3%
Lower priority topics chosen when collaborating	28.6%	32.2%

Norm there is a culture of North-South research partnerships

North-South research partnerships remain the norm in Africa. There are multiple reasons for this, including funding, established research networks, the real or perceived reality that the quality of research in HICs is better. As a Northern Africa FGD participant stated,

> … *(many of us) have experienced a positive culture of research abroad. We have seen the scientific integrity, the rigour, and the predisposition to collaboration "with researchers from the North". Unfortunately, in African countries what I have noticed is that this predisposition to scientific collaboration is very difficult. What I would like to see is that, just as we are predisposed to collaborate with our colleagues in Europe or elsewhere, there should be the same eagerness and ability in Africa. So, this is a point that is very important to me because I have noticed that we collaborate very easily with foreigners, with Europeans. But it is difficult to establish collaborations between Africans or even between Moroccans or between Algerians or between Tunisians. (ARC_Northern Africa FGD)*

The need to decolonise research was raised by a number of IDI and FGD participants, for example:

> *I'm part of a small working group that is trying to think about decolonising North-South research collaborations. There are a number of questions we are asking concerning collaborations and our own African research culture. Do we also need to revisit where we get our funding? And what are the terms of engagement? Do we, as Africans, get to speak about the research intentions we have? Or we are driven by the funder? What they say, what they fund we end up doing. Can we also project our voice so that we can be able to better address the African research problems with more buoyant research collaborations? Of course, our Northern partners bring a lot of value, but perhaps a more balanced power relation in terms of resource allocation, use and even interaction in deciding what the problems are and how we approach and tackle it in research. We have a space where Africa can relate and drive to such an agenda, even if the North funds us. (ARC _ KEIDI 07)*

Positive aspects of inter-Africa collaborations included the sense that fellow African researchers understood each other better and know each other's problems and that they were less expensive in terms of travel and salaries. However, it was also voiced by a number of researchers that they may take South-South research collaboration less seriously than those with researchers from the West.

Besides funding, research collaboration with partners in HICs were valued for access to more and better research equipment and skills development, for example new research methodologies and data analysis programmes, although this likely has more to do with the relative experience of the specific research partners. An Angolan researcher found South African collaborators to be "very good … very precise, they are always pushing Angola to do (more) research …."

Unfortunately, there are negative aspects of North-South research partnerships too. Foremost amongst them may be a sense of insecurity created by real or perceived power imbalances. An ECR from Sierra Leone commented, "But this consciousness that they know more than you do makes you a bit cautious in terms of what you say in meetings and how to put it." The potential benefit of African institutions and countries establishing their own journals was raised by a Kenyan study participant:

> *And that lack of creativity, that lack of establishing, generating our own journals leads to the fact that we leave little room for renaissance from Africa. What is the origin of knowledge produced and defined and influenced by the African model of thinking? Because you can only do that if this journal is within your control. But as long as the journal is controlled elsewhere, then it becomes absolutely difficult for you to do this. So, the African renaissance is being suppressed by this poor working environment. We are in an environment that does not actually invest in ideation, creativity and development of new theories. And we can only develop that if we ended up investing in more proper journals, and more authoritative journals, but also giving African voices more authority in the process. (KEIDI 06)*

At least one refereed/peer-reviewed, academic journal is published in 31 African countries, according to Ulrichsweb Global Series Directory. In 14 of the 31 countries, between 12 and 507 journals are published and are among the top 15 African countries in terms of research output, as indexed in Scopus, 2017–2019.

Expectation   **multidisciplinary or interdisciplinary teams are needed**

Numerous IDIs and FGDs noted the importance of having multidisciplinary or interdisciplinary research teams for researching. This is considered necessary because diverse expertise is often required to conduct meaningful research effectively. For example, a Zambian participant mentioned the need for an interdisciplinary approach to examine linkages between climate change and health, and a Sierra Leonean mentioned the need for researchers from different disciplines to work together to conduct One Health research.

This was often discussed in relation to partnership/collaboration models with researchers from the Global North and the frequent reliance on funding from HICs to conduct research in Africa. However, decolonising research did not mean no longer collaborating with researchers from the Global North but ensuring that power in the partnerships was balanced, the communication respectful. There was appreciation of the value and expertise that all parties brought to the collaboration.

However, it was also voiced that there was very limited funding to drive Africa-Africa research collaborations resulting in researchers looking for partners in HICs who had more access to funding. There was also a general sense that research with Western partners may be more rigorous. Concerns on equal authorship of journal articles and equal ownership of patents also came up when discussing collaborations. Thirty percent of survey respondents were concerned about both issues in collaborations with HIC researchers. A similar percentage, 27%, were also concerned with equal ownership of patents with LMIC researchers. Seventeen percent of survey respondents were concerned with equal ownership of publications in partnerships with LMIC researchers.

It was suggested that one means of decolonising the African research culture is to establish more academic journals on the continent.

Behaviour **bullying, discrimination or harassment are experienced by a sizeable minority**

A fairly large percentage (43%) of survey respondents reported that they had witnessed or experienced bullying or harassment, as shown in Table 6.

Table 6: Basis of Bully Perceived by Survey Participants

#	Basis of bullying	Percent of respondents who had witnessed or experienced each basis of bullying or harassment
1	Class or economic background	23%
2	Age	22%
3	Gender	21%
4	Race or ethnicity	21%
5	Nationality	12%
6	Religion	5%
7	Disability	2%

Twenty-five percent of survey respondents considered bullying or harassment a major or moderate barrier to research. Perhaps most concerning however was that 43% of survey respondents did not feel comfortable speaking out about bullying or discrimination at their work place due to fear and negative consequences. Table 7 identifies the perpetrator of bullying or harassment by the survey respondents.

Table 7: Who Are the Perpetrators of Bullying or Harassment as Stated by Survey Respondents Who Had Witnessed or Experienced Either

Ranking	Type of individual	Percentage of respondents
1	Supervisor, manager or another senior colleague	39.10%
2	A peer	10.50%
3	Junior colleague	5.30%
4	Junior and senior colleagues (were both stated to be perpetrators)	1%

A Nigerian participant commented that some may not perceive behaviours such as bullying or harassment as a problem but as part of the "learning process", "climbing the ladder in the system" or "part of (necessary) sacrifice". Although the participant immediately added that "anxiety" results from experiencing such behaviour:

> *Bullying and harassment contribute to poor mental health. But, of course, mental health issues are not something that people seriously pay attention to because we don't even talk about them. For my part, for the past few years, I have thought about them more and more as early career researchers have now begun to talk about what's going on …. (ARC _ NGIDI 03)*

Experiences were mixed with regard to how IDI/FGD participants perceived that their institutions would deal with bullying and harassment. One Ethiopian researcher declared, "I don't know, I feel that the institution may do nothing". Another Ethiopian stated that while they had never heard about a specific complaint "we have ethical ways of dealing with this kind of problem." An Egyptian researcher stated that Egypt is a conservative society and that such cases would be addressed through normal laws, not by academic or research institutions themselves. A Kenyan representative noted that there was a department within the university to address bullying and harassment complaints. Another Kenyan researcher noted it was an institutional policy for research trainees to have a different advisor and supervisor, so trainees did not feel trapped if a problem arises.

A Nigerian participant provided the following detailed response:

> *Yes, we do. We have a lot of documentation, they are everywhere. You will see those policies on the tables of those offices. The policies exist, but it's just that a lot of students don't know the power they have. Actually, these things happen, they get to me, and they are afraid. The policies are there, the school implements them, and people use those services. My institutions have all the sexual harassment policies, they take them very seriously.*

A male MCR noted that when he was a student 12 years ago, there was no system in place for a female student, for example, to report sexual harassment so students were afraid to raise issues. Today things have changed "a lot", especially since the Me Too movement, although problems likely remain.

The qualitative findings of the IDI and FGDs supported the survey findings that senior colleagues tended to be the perpetrators of bullying and harassment. However, senior researchers sometimes experienced bullying directly or indirectly from junior colleagues who have been appointed under unclear circumstances and are 'protected' by institutional leadership. Participants in the Eastern African FGD discussed an example of the latter situation when

> *… PhD students are related to well-connected people within the system, they want you to rush the student to graduate even when they have not really done what is required … it becomes very difficult on the side of the senior researcher.*

Behaviour hesitancy to raising a concern of any type

Seventeen percent of survey respondents reported that they would not be confident that their workplace would listen if they raised a concern. Fifty-four percent would be confident that their concerns would be listened to if they did. Twenty-nine percent did not have an opinion either way. A Northern Africa FGD participant noted the importance of working at problems within the research team, although this researcher felt that young researchers were more inclined to voice their concerns outside the organisation or country. The researcher commented:

> *When there is a problem between us (members of a research team I'm leading), it must be solved between us and sometimes, unfortunately, we meet more and more young people who send emails and who make or talk about our internal problems to people outside our team or our country, and that's why I say this. I think that this is very important, it's normal when you work as a team at some point there will be small problems, which is quite normal, but this must be settled internally and the young people must be aware of this. Of course, I have had problems in my career, and abroad, as I am involved in international collaborations.*

Another researcher in the same FGD then added:

> *We need to develop a certain culture to solve these problems in a scientific and rational way. And I am a bit surprised because we are scientists, we are rational, but when it comes to the individual, there is a personal ego that arises and that overrides everything.*

Norm work/life balance

The majority of survey respondents, 53%, agreed that their working environment has a good work-life balance and less than a third, 31%, disagreed. Sixteen percent neither agreed nor disagreed. Balancing time between work and personal responsibilities at home challenged some respondents, especially those that had to balance between research, teaching and health service delivery.

Norm limited time for research due to heaving teaching and service delivery

Heavy teaching and health service workloads limit time for research. While publications are important to researchers and institutions, teaching and, particularly for health professionals, service responsibilities must take precedence. As shown in Table 8, 40% of survey respondents spent over 60% of their time on research in the average year, although an almost equal percentage, 37%, spent less than 40% of their time on research each year.

Table 8: Average Percentage of Time Spent on Research per Year

Answer	Frequency	Percent	Cumulative Percent
20% or less	39	14.0	14.0
21-40%	65	23.4	37.4
41- 60%	56	20.1	57.6
41-60%	7	2.5	60.1
61-80%	57	20.5	80.6
81- 100%	54	19.4	100.0
Total	**278**	**99.9**	

healthy versus unhealthy competition

Study participants reported that competition can be healthy or unhealthy. Over half, 52%, of survey respondents agreed that their working environment encouraged healthy competition. However, when asked if there was unhealthy competition at work a sizeable minority, 40% agreed that there was, including 13% who agreed strongly that there was.

Related to the issue of competition was a concern about the benefits of research sometimes going to individuals as opposed to benefitting and strengthening the capacity of institutions.

Norm **creativity is encouraged**

Fifty-two percent of respondents agreed that creativity was encouraged in their working environment compared to 36% who did not.

Value **it is expected that research is conducted ethically and should serve and respect communities**

Numerous IDI and FGD participants stressed the importance that research must be ethical. For many participants, ethical research consists of research that serves the needs of communities, explains the purpose of the research to community participants, and reports back the results of research to communities. The importance of conducting ethical research, especially when rural communities are involved, was highlighted by a researcher in the Western Africa FGDs, as presented below:

> *In Senegal, for example, we had research in a village where people were going to take a blood sample and the villagers said, you are always coming here to take our blood samples and we don't know what you go and do with our blood. So, you don't explain to us, you come, you take our blood, and you go, and we don't see the impact of what you are doing; because they are not aware. So, when we talk about ethics it shouldn't be just signing documents and trying to bypass rules and trying to do our best to get our result without even explaining why we are doing the research. So, at all levels, I will put ethics as key. Ethics in the implementation, ethics in the use of money, ethics in the use of the research product, like output, the data generated, we talk about that sharing today but this also must be accompanied by clear rules, for example. So, this is a big question but I would say, ethics is key in everything we do. (ARC _ WARIMA FGD)*

However, clear standards have been established and practised. As a Tanzanian researcher stated, "Research integrity is extremely valued. The process is very clear, and you have to undergo that scrutiny. If there is any problem, then the project will be stopped." A study participant from Guinée commented:

> *Perhaps the most important aspect above all is the respect for ethical standards in fact. There are international standards, but in principle, each country [has its own standards]. These standards are also contextualized and therefore from this point of view, they take into account the social values of the community or the locality.*

Although ethical conduct and academic rigour was stated to be an important component of a positive research culture, 63% of survey respondents answered that their workplace could do more to prevent the cutting of corners. An Ethiopian ECR commented that some senior researchers lacked interest in their research because of low salaries. This resulted in supervisors sometimes not engaging fully in the research work they reviewed.

4.3 Findings Regarding Inclusion, Equity and Diversity

Overall finding – the research culture is not inclusive for some

Seven issues are discussed in the context of inclusion: language; disability; gender; access to publications; and, open access to data.

Language

Ninety percent of survey respondents from countries in which French is used as the principal or one of the principal languages of instruction in higher education stated they had to publish in English in order to engage internationally. Almost three-quarters, 74%, of survey respondents from the 12 countries in which French is a principal language of instruction in higher education said they needed to publish in English in order to be promoted.

Disability

Sixteen survey respondents identified as disabled. None of them described their disability. Three of the 16 (19%), responded that they had experienced bullying, harassment or discrimination. A senior, male researcher from a Kenyan university noted that while gender inclusion on teams was mentioned specifically, including disabled researchers was not. A female ECR from Kenya noted a situation where mute participants, in a meeting, were not able to participate actively because a sign language interpreter was not invited to it.

Transformation in South Africa

Transformation of South African universities is underway to address injustices during apartheid and before then. A senior representative of one of the country's three leading research universities stated their university has a "whole suite of programmes" to address historic injustices. Recently they were reviewed by external independent evaluators to access what was working and what wasn't. One of the leading programmes is encouraging female academic leadership. It is mainly targeting black women.

Gender

The vast majority of all participants responded that their countries and institutions had policies in place to address gender discrimination and increase the number of female researchers. Views on the effectiveness of the policies varied greatly among study participants. A Kenyan researcher noted that employment notices included the disclaimer that "minority groups were encouraged to apply" but wasn't sure how things work in practice. A male Zambian researcher at a South African non-governmental organisation (NGO) noted that there were more women than men within his organisation. A senior female Kenya researcher noted:

> *I see a lot of women included in research. But then, at some point, I began to wonder, how about men?*

A female Egyptian researcher noted that males were more likely to work in industry or the private sector. A female Nigerian ECR was not aware of any policies that promoted women and marginalised persons, although she felt she has the freedom of opportunity to achieve whatever she desired. However, a female Nigerian MCR noted that the National Research Fund (NRF) has inclusivity "yardsticks" and mentions the importance of gender-based inclusivity. This results in her research teams being intentional on wanting to have a gender balance when organising workshops and collaborations. She also noted that some researchers don't want to work with women because female researchers need to multi-task more than men because of family responsibilities. She further noted that department heads tend to be mostly male.

The gender dynamics in some African cultures appears to be changing to some degree, although the degree and dynamics vary from country to country and between countries. It is notable that the survey found that 39% of female respondents identified "caring responsibilities" as a "major" or "moderate" barrier hindering their research career, 27% of male respondents did too. As shown in Table 9, caring responsibilities were greatest for infants followed by youth.

Table 9: Type of Caring Responsibilities That Hinder Women's Research Careers

Type of caring responsibilities	Percent
Carer of a child/children under-5 years of age	28%
Carer of a child/children above 5 years of age	19%
I have no carer responsibilities for any groups listed here	16%
Carer or assistant for an older person/people (65 and over)	14%
Carer or assistant for a disabled adult (18 years or over)	3%
Carer of a disabled child/children	1%

Access to publications

A majority of respondents felt they were excluded from the global research ecosystem due to a lack of access to publications. Sixty-three percent of respondents stated a lack of subscriptions to journals was the greatest barrier. Some IDI participants worked around this challenge by requesting colleagues in other countries to access articles for them when they weren't available locally. South African respondents generally perceived they had good access to journals. Twenty-three percent of all survey respondents identified poor internet access as a significant barrier, although almost twice that percentage, 45%, of respondents from Central Africa identified internet access as a problem. Sixteen percent of survey respondents identified their limited capacity to conduct a search strategy was the problem. This latter finding indicates the need for capacity strengthening for some researchers.

Open access to data

Concern was voiced about data collected not being readily available to other researchers in Africa. It was voiced that some researchers were not willing to share new findings openly until they were published. A participant in the Southern Africa FGD commented that some fellow researchers appeared to be secretive about their work, and technologies they were developing. This researcher felt it was due to competition for funding and dynamics within the department. A Togolese researcher noted that access to data between research institutes is dependent on agreements between institutions. This researcher further commented that such agreements were not signed in some countries and this set back research opportunities.

Participation in international conferences

Participation in conferences was limited for some due to a lack of information about them. Besides the cost of attending conferences, African researchers are often excluded from them when visas are required to enter the host country[10][5].

4.4 Findings Regarding Differences in Research Management Systems in African Sub-Regions and How They Impact on Research Culture

Approximately two-thirds, 68%, of survey respondents stated that their institution had a research management unit. Less than a quarter, 24%, of survey participants considered the quality of the research management unit at their institution to be "good". A greater percentage, 28% considered the quality to be "poor". Forty-eight percent 48% considered the quality to their unit to be "fair".

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[5]See also Why visas are a hot topic right now at the International AIDS Conference (2022); The UK's self-harming scandal of visa rejections for visiting academics (2019)

Research cultures across Africa continue to develop and emerge. A participant from Northern Africa spoke of attending a workshop and training in South Africa organised by the African Academy of Sciences a few years ago (2019). This IDI participant mentioned learning about the activities of the Southern Africa Research and Innovation Management Association (SARIMA). Following the visit to South Africa, the participant helped establish the Northern Africa Research and Innovation Management Association (NARIMA). NARIMA's approach, however, appears slightly different than SARIMA's as the former focuses on linking researchers with investors while SARIMA focuses more on research management at universities.

Finally, concern was raised in multiple sub-regions about the research environment of some institutions being overly bureaucratic. For example, an Ethiopian researcher commented that colleagues found the "handling of finance with different finance offices a problem in general". In the Southern Africa FGD, a participant commented about delays due to the research (ethics) board being dissolved temporarily. A Ghanaian researcher commented that some colleagues experienced institutional bureaucracy issues without naming specifics. This researcher continued by noting that government bureaucracy can pose challenges, noting that "some of the processes for research, registration of research and permits, are very straightforward while others are not".

4.5 Findings Regarding Differences in Research Culture in Different Countries and/or Sub-Regions of Africa

Researchers are generally positive about the research culture in which they work

Overall, respondents were positive about the research culture of their institutions. Forty-six percent of survey participants answered that they viewed the research culture of their institution "positively" and 11% viewed it "negatively". In no sub-region did negative responses outnumber neutral or positive responses (Table 10). This general positive perspective concerning research culture at institutions was supported by IDI and FGD participants.

Table 10: Perception of Research Culture in Different Countries and/or Sub-Regions of Africa

Sub-Region	Positive	Neutral	Negative	Did Not Answer	TOTAL
Central Africa	10	6	2	2	20
Eastern Africa	71	38	15	38	162
Northern Africa	1	3	0	1	5
Southern Africa	18	15	6	4	43
Western Africa	40	19	9	6	74
TOTAL	**140**	**81**	**32**	**51**	**304**
Percent	46.10%	26.60%	10.50%	16.80%	

Consistent with the overall general perception of the research culture of their institution, over four times as many survey respondents answered that they were "satisfied" or "extremely satisfied" (59%) with their research careers compared to those who responded that they were "dissatisfied" or "extremely dissatisfied" (13%). Eighty-nine percent of survey respondents stated they planned to continue as researchers in Africa.

Interpretation of Findings Based on the Questions Asked to Achieve Study Objectives

Positive research culture and perceptions, behaviours, values, expectations, attitudes and norms found in African research communities

Publishing is clearly important to members of African research communities, including the researchers themselves as well as the administrators and managers of African universities and other research institutions. For researchers, publishing is crucial for an array of reasons, including personal recognition, promotion at their own institution, securing additional funding, and identifying opportunities outside their own institutions should they desire. There is some concern among researchers that publication metrics and, by extension, university rankings have become too great of a focus for some administrators at some institutions.

Although publishing is important to researchers, they are concerned simultaneously with a range of other issues that are part of a positive research culture. These include having collaborations both at their institution, within their own country and outside Africa that allow for multidisciplinary or interdisciplinary teams to be formed. This ensures that a research team has the range of skills and experiences to compete for competitive grants and successfully implement studies once awarded.

Many researchers also have longer-term perspectives and appreciate that a supportive, inclusive system is required to continue to conduct research year after year and for generations to come. Thus mentoring, financial support for ECRs, and teaching responsibilities are also considered important. Also important is for institutions to foster an open, respectful and supportive working environment. Policies to address issues such as bullying, harassment and discrimination are necessary and systems need to be developed to ensure the policies are implemented and concerns or grievances can be raised, reviewed and addressed effectively within organisations.

African researchers have a strong desire to produce research results that will improve the lives of the communities with which they conduct research and countries in which they live. Researchers are also concerned about ensuring that research findings reach the communities where the research was conducted and is translated into policy that will improve their lives. For some researchers this seems almost as important as having research findings published since publication without addressing poverty or improving health is seen as falling short, if not unethical.

There appears to be a general perception that African research is subservient to, or at least to some degree, directed by the interests of the Western world. The dominance of Western pedagogy and research methods and the desire by African researchers to publish in high-impact journals, which are all published in Western countries, contributes to this perception. This perception could also be a legacy of colonialism.

A sizeable number of African researchers value the approach and skills of Western researchers and not simply the funds that come from collaborating with them. Respectful, empowering, open and healthy interactions should be the norm whether the research collaboration consists of researchers in the same department, institution, country or sub-region of Africa or stretches across African sub-regions or extends to non-African partners.

Differences in Research Culture and Management Systems Across African Countries

It is not possible to interpret specific findings about differences in research culture and management systems across African countries based on the findings of this study. Instead, some general reflections about the research culture in a handful of countries and in a number of countries with shared characteristics are made in addition to suggesting an approach to examining this in a future study.

South Africa continues to have dominant research status in Southern Africa and sub-Saharan Africa but it appears that the country is experiencing a unique set of challenges currently and will continue to in the coming years. Government of South Africa research funding appears to be decreasing. This may not challenge the South African research culture and ecosystem immediately if global funding levels are maintained but it may pose challenges for supporting ECRs and harm South Africa's research system in years to come.

Eastern Africa has a plurality of countries – Ethiopia, Kenya, Tanzania and Uganda – with relatively large research outputs and balanced power dynamics between them.

Northern Africa researchers are largely collaborating with researchers in their own country, Europe, the USA and Saudi Arabia. Linkages with sub-Saharan African researchers remains limited.

The SARIMA appears to remain the most well-established research management support network on the continent, followed by the Eastern association (EARIMA) and then the Western (WARIMA). The Central (CARIMA) and Northern (NARIMA) associations seem to be less well established.

The Social, Cultural and Economic Factors (i.e. Main Drivers) Contributing to the Research Culture in Africa Countries

Although African researchers generally have a positive perception of the research cultures within which they work, there is a prevailing sense that their research ecosystems are operating with significant limitations. This includes the shortage of national funding for research, the shortage of research infrastructure, the shortage of researchers themselves and necessary research skills and, insufficient research management and administration support. There is the perception that capacity gaps for conducting research are serious.

The perception of limitations, which often, but not always, appears largely to be based on reality, results in African researchers looking outside Africa for support, principally to researchers and funders in Western countries. The influence of Western thought and funding on African research culture is great. This includes collaborations with researchers from Western countries, valuing Western academic material over research produced in-country and, often, reliance on Western funding for conducting research.

The habit of looking to Western countries for research support is not problematic unless it fosters a dependency syndrome. Clearly African researchers view many aspects of their collaboration with Western researchers as positive but there are potential negative aspects of collaborating with Western researchers too. The latter must be managed to ensure that these collaborations empower African researchers and assist with strengthening the African research ecosystem.

The desire to largely publish in Western journals discounts the value of the numerous African journals that African researchers could also publish in and likely hinders the development of them and the research culture and ecosystem of Africa. The South Africa Department of Higher Education and Training maintains a list of accredited journals to which anyone can refer[6].

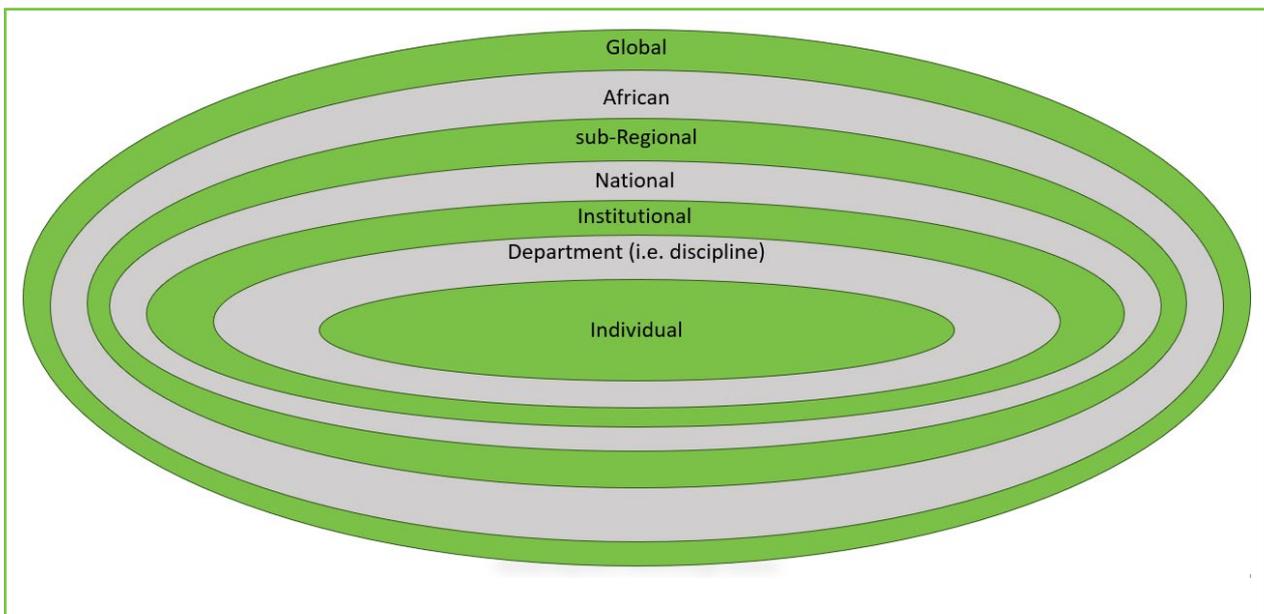[6] https://www.uj.ac.za/research-at-uj/dhet-accredited-journal-list/

Figure 4: Seven Levels to Consider When Reflecting on African Research Culture

When reflecting on African research culture, it is useful to reflect on seven levels, as per the diagram above.

1. **Individual:** Each researcher has their own lived experiences, formal qualifications, skill set, networks, socio-economic status, cultural influences, physical attributes, beliefs and perspective. These will all influence their interactions within the research culture(s) in which they work.

2. **Department (i.e. discipline):** Academic disciplines have different approaches to research sometimes, especially research methodologies. These will influence the research culture.

3. **Institutional:** Each institution (e.g. university, research institute) has its own history, personnel, financial status, mandate, vision, and relationship with communities with which it interacts. These will influence the research culture of the institution and how it interacts with other institutions. The vision of some universities is more research intensive than others.

4. **National:** National factors, including government policies, wealth and size, history, and national and other languages influence research culture.

5. **Sub-Regional:** Africa is a huge continent. Inter-African travel is often expensive and challenged by poor connections. Certain countries (e.g. Egypt, South Africa and Nigeria) act as research hubs. This influences research collaborations and thus research culture.

6. **African:** It is useful to sometimes consider factors specific to Africa when considering research culture.

7. **Global:** There are global factors that influence all research. Scientific discovery is shared and tested globally. There are international standards and established practiced. Although there are dominant paradigms they are challenged constantly. English is the dominant language of research. Specific countries may have greater influence over the global research culture but like research culture in Africa, the global research culture is dynamic. The most prestigious journals are published in the West. Visa policies make it challenging for African researchers to attend conferences.

Strengths and Limitations

Study strengths

1. The findings reflect an African perspective – a voice of African researchers working on the continent. This provides the most accurate experiences, and an empowered voice to speak about what affects African researchers' ability and manner in which they conduct research.

2. Our methodology – a mixed method study approach backed with evidence from a scoping review provides a robust evidence base against which further study of the evolving research culture in Africa can be further interrogated. We obtained rich qualitative data that provides nuance on the topic.

3. The inclusion of participants from all five AU sub-regions. Balanced participation was achieved between sub-regions for the FGDs.

Study limitations

1. Not all African countries were represented. The study included participants from 32 of the African Union's 55 members. The sub-region of Northern Africa was poorly represented.

2. The overall sample size was relatively small – 304 survey respondents; 55 IDI and 45 FGD participants. In addition, the sample size for many of the 32 countries with participants was small.

3. While the study team sought to reach out to researchers across multiple disciplines, the background of the team and thus their networks were biased towards medicine and the health sciences.

4. The decision to only include researchers of African descent in the study can be considered a weakness as well as a strength of the study. The weakness of not including non-Africans who are resident in Africa in the study is that there are many of them holding prominent positions in African universities and other research institutions.

5. There was a relatively large number of non-responses to certain survey questions – we offer no explanation for why this was the case and no suggestions for future surveys.

6. Internet connectivity proved to be a limitation. Poor connectivity resulted in IDIs needing to be rescheduled or cancelled outright. In addition, some FGD participants weren't able to participate in the full discussion.

Key Recommendations

The study unveils a rising, evolving and expanding research culture that is perceived to be largely positive. We suggest a set of actions that may help address the negative aspects, as well as continue to build on what is viewed as largely a positive research culture, albeit facing challenges.

1. African governments are advised to increase research funding as they have committed to do. This will reduce the overreliance on external development partners research funds. This will also allow the continent's researchers to pursue and set the national and regional research agendas based on priority problems.

2. Research leadership should instil an empowering mindset within their teams and when forming collaborations, whoever the research partners. This will help improve the power relations within all research collaborations whether they are among researchers from a single institution or a single country or unite researchers in South-South teams or North-South research collaborations. This will assist in improving the funding arrangements within research collaborations, the dynamics of the research and balance the ownership of research outputs – patents, manuscripts, innovations, etc.

3. Address inclusivity issues through targeted policies with implementation plans and tracking mechanisms.

   a. After funding, the issue of language appears to be the single greatest issue of inclusion facing Africa. One, it influences the ability of researchers to work with researchers from other countries, even within sub-regions. Two, much research must be conducted in indigenous languages although academic publications are principally in English and then French. In order to ensure the research findings are effectively communicated to study populations, research findings need to be translated into the languages spoken by communities. In order to better ensure that research conducted by non-Anglophone researchers is also published in English, study budgets need to expand to include translation of study materials and support non-Anglophone researchers to publish in the dominant language of international research, English.

   b. Disabled researchers were found to be discriminated against. They deserve particular support especially since there are not a large number of disabled researchers yet there are a large number of disabled people in Africa.

   c. The gender inclusivity and equality movement has progressed over decades and gender outcomes have improved. All gender mainstreaming strategies need to be continued and continually revised to address current realities in African research.

4. Ensure effective institutional mechanisms are in place so policies are implemented, for example, so issues of bullying and harassment are addressed effectively. Institutions were said to have policies in place but there might not be an effective system in place to implement them.

5. Increase the visibility of African researchers by supporting the development of new African journals and strengthening existing ones. This should include strengthening the capacity of researchers to review manuscripts effectively, and the indexing of these journals in leading platforms.

6. Improve research infrastructure to include physical facilities and research management support which is often unavailable to African researchers acquiring and managing grants.

7. Solve the unemployment rates among researchers after their doctoral and postdoctoral training to ensure retention and avoid brain drain. Evidently, poor pay, poor research environments, and lack of research management support are current drivers of brain drain for African researchers.

8. Ensure that research is respectful of local communities and, when practicable, beneficial to their needs.

Areas for Further Research

1

Case studies of core (i.e. research intensive) and periphery (i.e. established this century) universities in at least two countries per sub-region.

2

A study focused on the research culture within the private sector and industries.

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Annexes

Annex 1 - General and research data for African countries

Annex 2 - Demographics of Survey Participants

Annex 3 - Scoping review

Annex 4 - Study team composition

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