GDN Global Development Network


# The Research for Development (R4D) Landscape in Central and West Africa

## Contents

## Executive Summary

The IDRC Central and West Africa Regional Office (WARO) commissioned the Global Development Network (GDN) to study the research-for-development (R4D) landscape for its region of competence comprising 24 countries and territories. The main objective is to identify changes in the context, as well as institutional gaps and opportunities for R4D in the region. To achieve this, the study asked the following three leading questions:

1. What is the current institutional landscape for R4D in IDRC regions?
2. What are the relative strengths and weaknesses of actors or contributors towards R4D relevant for Strategy 2030 (i.e., universities; think tanks; government; major NGOs that conduct R4D)?
3. What salient recent trends or shifts have occurred in the composition and the role of actors in the R4D landscape over the last five years?

Data were collected through a desk-based review of gray and academic literature, key informant interviews (KIIs) of six senior experts from across the region, and Global Development Network (GDN)'s own operational knowledge of the R4D space in West and Central Africa.

**Main Findings**

The findings are presented in the following three parts in relation to the three questions above: Key trends for the Central and West Africa R4D landscape (2018-2023), Central and West Africa's R4D landscape: Country typologies, and Central and West Africa's R4D landscape: Actor typologies.

**Key trends for the Central and West Africa R4D landscape (2018-2023)**

This rapid assessment of the R4D landscape has identified six trends that are currently shaping R4D in Central and West Africa, including *lack of evidence on R4D space, socio-political changes, rising political salience of STI (at the expense of social sciences), low implementation capacity drives the deterioration of existing research capacity, research systems lack a coordination agency, continued reliance on external sources of research funding, health research leads investments in research, and the exclusion of women from research careers.*

*Lack of evidence on R4D space:* Data on national-level research capacity indicators are generally lacking or, where available, are incomplete, outdated or inaccessible. Basic information on research funding, the number of researchers in a country, the number of scientific journals or benchmarking of their quality is scarce for most countries in West and Central Africa. This trend is often highlighted for the field of Science, Technology, Engineering and Mathematics (STEM), which is at the center of large investments and much policy attention (national and international). As a result, it remains difficult to accurately prioritize and target investments and policies, let alone develop evidence-based strategies to support the sector. A concerted effort is needed to scale up and institutionalize the generation of data and evidence on research systems for R4D, with national institutions responsible for national research policies and systems at the forefront of these efforts, together with a growing community of researchers interested in data generation and comparative analysis of research policies, funding and infrastructure.

*Socio-political changes:* Violent conflict and political instability in the region have had a significant (though admittedly difficult to quantify) impact on funding, careers and research agendas. Political instability in several countries, including Chad, Guinea, Mali and Nigeria, has led to a situation of 'protracted crisis'. In these cases, in addition to the relocation of research capacity away from flashpoints of violence, access to research resources, particularly funding and collaboration opportunities for research on topics not directly related to conflict, becomes more limited. This trend is reinforced by the recent wave of military coups in West and Central Africa: previous evidence, at least from Nigeria, suggests that research funding, human capital and physical infrastructure for research suffer from these shocks and require stable, long-term investment to thrive. Socio-political changes have also influenced the type of research demanded by national governments and regional policy makers, and funded by international donors.

*Rising political salience of STI (at the expense of social sciences):* The number of national and regional policies that explicitly focus on research and its contribution to development is growing, and spillovers from regional to national debates are evident. Research policy and research funding have become an issue in their own right in policy debates, i.e. separate from higher education policy and funding, and commitments to research funding have been made at the highest levels. In some countries, this has been accompanied by an upward trend in budget allocations to research. However, the social sciences remain marginal to this positive change, even in countries with significant and productive social science communities such as Nigeria and Ghana. Recent research in Nigeria, for example, shows that only about 9% of gross expenditure on research and development (GERD) goes to social science research. Not only are the social sciences pathologically underfunded compared to other disciplines, they are often not on the radar of national science councils, funding agencies and other key actors. The Science Granting Council Initiative (SGCI) is one of the international programmes focused on strengthening national institutional capacity for R4D that has not yet included the social sciences on its agenda.

*Low implementation capacity drives the deterioration of existing research capacity:* Expenditure rarely follows budget allocations. The African Union recommends that each African country should spend at least 1% of its GDP on R&D. ECOPOST, the ECOWAS Policy on Science and Technology, makes the same recommendation and calls for each ECOWAS country to establish a national S&T fund, which would allocate funds and prizes on a competitive basis. According to the latest official statistics, no country in West and Central Africa is close to achieving this goal. This long-term trend has taken its toll on the quality of institutions and research careers. Even the most established universities in West and Francophone Africa, even if they are very well connected to their peers, lack adequate internet connectivity, access to literature, and access to funding to make their research visible online. This reality cannot be overemphasized: working conditions not only distort incentives for researchers, but also inhibit research capacity.

*Research systems lack a coordination agency:* The short-term nature of policy cycles in the region, typically 4 years, in an environment where there is no guarantee of continuity between cycles, is a major disruptive factor, but the low capacity of science funding councils to play a coordinating role at the level of the research system is a major obstacle. Granting councils and research funds, where they exist, lack a clear mandate, visibility and institutional capacity to implement existing

policies, influence their evolution and shape the incentives faced by researchers. Although this is a problem in all countries, it has the greatest impact in the leading countries, such as Nigeria and Ghana, where research policies or funding initiatives exist. The main consequence of this form of coordination problem is a decoupling of activities in different parts of the research system, with individual researchers or research institutions responding to incentives coming from the regional or international level. The examples of The African and Malagasy Council for Higher Education (CAMES) and the Tertiary Education Trust Fund (TETFUND) aptly illustrate the limitations of 'uncoordinated' national systems, but also the potential for change through policy development.

*Continued reliance on external sources of research funding:* Domestic funding for research in West and Central Africa comes mainly from governments, but is often limited in volume and flow. As a result, individual researchers and research institutions invest significant resources to access competitive international funding to pursue their research activities. Despite the lack of clear or systematic data on funding flows, this is a well-established trend. If international funding is an essential component of the R4D landscape, it poses two main challenges: domestic researchers and policy institutions have limited capacity to shape the research agenda and define the funding priorities of foreign donors; significant resources are invested in building long-term and exclusive relationships with international donors, who themselves are often looking for trustworthy and capable grantees in a landscape of which they have limited knowledge. These trends create incentives to align national research agendas with those of donors and to compete at the expense of collaboration.

*Health research leads investments in research:* Across all the countries in the region, research is heavily concentrated in the so-called hard sciences, but a strong focus on health-related research is obvious from a look at research output. In a narrower sense, health research attracts a significant share of available resources, including from international donors. The UK government and the Wellcome Trust alone will spend £873 million globally between 2016-2021 on dedicated initiatives to strengthen health research capacity, with a further £1.2 billion spent on research activities with a capacity strengthening component. No other sector comes close. Importantly, the health capacity and initiatives that some countries have developed during health crises tend to spill over into other parts of the research system, including policy space and the private sector.

*The exclusion of women from research careers:* In most countries in the region, the proportion of women in research is below the regional average of 29% and the global average of 30%. Women are also under-represented in academic bodies and research structures, where there are few women research directors, professors, heads of laboratories, institutes or universities. The implication is that with fewer positions of responsibility, women could not participate in institutional decision-making and therefore cannot integrate the gender dimension into the research ecosystem. These inequalities are exacerbated by socio-cultural constraints, religion and self-censorship, which act as bottlenecks to the implementation of gender equality policies and their institutionalisation in higher education institutions. Other challenges that continue to hinder the institutionalisation of gender policies include lack of understanding of the concept of gender, denial of inequalities and resistance to change. Research systems reproduce the same social inequalities, often consciously or unconsciously, so it is important to study these forms of inequality and their impact on women's research.

**Central and West Africa's R4D landscape: Country typologies**

We classify the countries in the region based on the impact the trends highlighted above manifest themselves, and based on the current performance of their R4D systems. We propose 3 main groups: *relatively advanced research systems, fast emerging research systems, and research systems lagging behind.*

***Relatively advanced research systems:*** *Senegal, Ghana, and Nigeria:*

These three countries are home to some of the best and most established academic institutions in the region, rank high in the region in terms of publication output, produce generations of qualified researchers and attract significant donor funding. At the same time, the lack of coordination in the form of an effective and empowered agency capable of linking funding, research policies and research agendas hinders the development of the research system and the alignment of national priorities with ongoing R4D efforts. Many strong think tanks operate in these countries and can provide almost any analysis for governments and donors with methodological sophistication.

***Fast emerging research systems:*** *Cameroon, Burkina Faso, Niger, Côte d'Ivoire, and Benin:* The countries in this category show significant upward trends in the number of publications, reflecting a dynamic research environment. In some countries, the number of researchers and research institutions remains low, and in others, the new generation of researchers often finds it difficult to find employment. In these countries, despite the existence of strong universities, many researchers and donors prefer to carry out R4D through administratively lighter structures, such as think tanks. In most of these countries, there is no functioning research council or other coordinating body at the system level.

***Research systems lagging behind:*** *Guinea, Congo, Democratic Republic of Congo, Mali, Chad, Mauritania, Sierra Leone, Gambia, Togo, Central African Republic, Guinea-Bissau, Cabo Verde, Gabon, Liberia, Sao Tome and Principe, and Equatorial Guinea:*

Countries in this particular category face significant challenges due to the absence of institutional frameworks for research, science policy, and funding. This deficiency is hindering the progress of researchers across generations, although there are a few limited exceptions. These countries have limited capacity to utilize evidence for policy development. International research funding plays a vital role in these nations, but it often prioritizes health and security issues. Additionally, there is a shortage of domestically trained researchers with PhD qualifications, and the overall volume of research output remains very low. It is worth noting that these countries include politically unstable ones, where development, security, and the impacts of climate change further compound the need for policy-relevant research-based evidence.

**Central and West Africa's R4D landscape: Actor typologies**

The analysis identified six different types of actors: universities, independent think tanks, government research institutes and think tanks, NGOs, national research councils and international development agencies. All of these actors are present in West and Central Africa, but there are notable differences between countries, which are compounded by differences in national research capacity.

1. International institutions play an important role in the funding and direct implementation of research in the region. The main international institutions involved in research in West and Central Africa include the World Bank, the International Monetary Fund (IMF), the United

Nations Economic Commission for Africa (UNECA) and the African Union Commission (AUC). These institutions have access to considerable resources and expertise, and can reach a wide audience with their research. However, they can also be bureaucratic and may not be as responsive to local needs as other actors.

2. Sub-regional institutions also play an important role in research in West and Central Africa. The Economic Community of West African States (ECOWAS) and the Economic Community of Central African States (ECCAS) are among the main sub-regional institutions involved in research in the region. These institutions coordinate research activities, promote collaboration between researchers and facilitate knowledge exchange. They are well placed to understand local needs and build relationships between researchers. However, they may not have the resources or expertise of international institutions.

3. National institutions are important actors in research in West and Central Africa. The main national institutions involved in research in the region include universities, think tanks and government agencies, including policy organizations. These institutions conduct research, train researchers and disseminate research results. They are well placed to understand local needs and build relationships with communities. However, they may not have the resources or expertise of international or sub-regional institutions.

To a lesser extent compared to the above groups of actors, civil society and the private sector play some roles in the R4D landscape in West and Central Africa. Partly due to its complexity and lack of data, the role of civil society is somewhat unclear, but some activity appears to be taking place in this sector. Within the broader private sector and civil society, there has been a proliferation of organizations that take the form of think tanks, either governmental or private. These think-tank type structures, especially the private ones, are often perceived as more independent, transparent and free of unnecessary bureaucracy. They therefore appear more attractive to international donors as an easier platform for research.

**Conclusion: Opportunities and Implications**

The research landscape in the West and Central Africa region is vast and diverse, but also divided between a new political dynamic and the limitations of a 'shallow' institutionalization of R4D. The lack of systematic data and evidence on the changes underway complicates the task of identifying challenges and, in particular, opportunities. In a scenario where international funding remains key, however, IDRC can play a very significant role and pursue a wide range of objectives.

**Boosting the collection and analysis of data and evidence on the R4D landscape** will in itself have a transformative effect on the sector. A generation of capable local researchers is interested in making a critical contribution in this regard.

Supporting the **generation of policy-relevant evidence** on themes of interest to IDRC can support the need for deeper institutionalization, if the modalities of such support incentivize local institutions to build long-term research agendas rather than deliver projects and papers.

**Strengthening R4D systems** will require even greater engagement with science granting councils. Support to these institutions should aim to strengthen their capacity to coordinate the national research system, design incentives for local researchers, negotiate partnerships, inform policy implementation with data and evidence on the state of the R4D landscape, and prepare them to receive and manage national and international funding.

Finally, IDRC could play a key role at the global level in advocating for a change in the **rules of the publishing sector** to allow open access to scientific knowledge, which remains (unjustifiably) a problem for even the strongest institutions in the region and a handbrake on the development of the sector.

## Introduction

The purpose of this study is to describe and analyze the landscape for 'research-for-development' (R4D), in West and Central Africa, with reference to the 2018-2023 period. This IDRC region comprises 24 countries and territories falling under the coordination of the IDRC regional office in Dakar, Senegal.[1] The main objective of the report is to identify changes in the context, as well as institutional gaps and opportunities for R4D in the region, in order to inform IDRC's strategy and approach going forward (see Annex 1). To achieve this, the study asked the following three leading questions:

1. What is the current institutional landscape for R4D in IDRC regions?
2. What are the relative strengths and weaknesses of actors or contributors towards R4D relevant for Strategy 2030 (i.e., universities; think tanks; government; major NGOs that conduct R4D)?
3. What salient recent trends or shifts have occurred in the composition and the role of actors in the R4D landscape over the last five years?

These questions are answered in the executive summary. The full report discusses, in order, the methodology, trends in the R4D space; a country typology based on the impact of these trends in the region; and a discussion of actors in terms of their influence on the R4D landscape. Finally, it proposes a number of implications this analysis can have for IDRC.

## Methodology

The report draws on three main sources: a desk-based review of academic and gray literature, key informant interviews (KIIs), and GDN's own operational knowledge of the R4D space in West and Central Africa. The desk-based review focused on gray and academic literature. Among secondary sources, the note draws heavily on the ongoing work of the Global Development Network (GDN)'s Doing Research global initiative and completed and ongoing Doing Research Assessments.[2] Key

[1] The 24 countries include Senegal, Ghana, Nigeria, Burkina Faso, Cameroon, Cote d'Ivoire, Benin, Democratic Republic of Congo, Congo, Niger, Togo, Guinea, Sierra Leone, Mali, Chad, Gambia, Central African Republic, Guinea-Bissau, Mauritania, Cabo Verde, Gabon, Liberia, Sao Tome and Principe and Equatorial Guinea.

[2] The Doing Research global initiative is the first attempt to generate systematic comparative evidence on the state of research systems in low and middle income countries, with a specific focus on policy-relevant social science research. Countries covered by GDN's Doing Research global initiative: Benin

Informant Interviews (KIIs) were conducted with experts familiar with the regional R4D landscape. KIIs were conducted online with six senior experts from across the region, from a mix of organizations (universities, research institutes, think tanks and multilateral development organizations) active at the regional level in the R4D space - see Annex 2 for Categories of KII Respondents and the KII protocol. The KIIs generated data that helped to broaden and deepen insights emerging from desk-based data, guided by the understanding of the R4D landscape of the authors.

The authors applied established protocols for data analysis, which included synthesis of themes and categories, and interpretation (Charmaz & Belgrave, 2014). Data triangulation throughout the synthesis process combined primary (interview) and secondary (documental) sources whenever possible, and within a process remained iterative and inductive in nature. Within the timeline and budget available for this exercise, interviews were limited to a small number of researchers in the region, and the review of the literature and relevant data was iterative. Further work will be essential to broaden and deepen the validity of the analysis presented below.

## Findings

### *Key trends for the Central and West Africa's R4D landscape (2018-2023)*

As a continent, Africa has historically contributed a disproportionately small and only slowly growing share of global science. The share of global scientific publications (excluding the Arts, Humanities and Social Sciences) that emanated from sub-Saharan Africa increased from 1.4% in 2015 to 1.8% in 2019 (UNESCO, 2021), against a share of the world population of 17%. Inequality in research production between Africa and the rest of the world is reflected also between regions of Africa, and within single sub-regions. There is a persistently wide divide between Nigeria, Ghana and the rest of the countries in West and Central Africa (see Table 6 in Annex 3). In particular, 69% of all research articles produced in West and Central Africa between 2018 and 2022 came from Nigeria and Ghana. Of the many universities in all West and Central African countries, only 15 (of which 3 in Ghana and 1 in Nigeria) appear among the top 100 in Africa. The next five countries, Cameroon, Senegal, Burkina Faso, Cote D'Ivioire and Benin produced 20%, most of this coming from Cameroon and Senegal. Rankings aside, (limited) available data suggests that countries in West and Central Africa have as few as 50 or 60 researchers per million inhabitants (see Table 1 in Annex 2).

The observed inequality in research production is driven by several factors including differences in levels of economic development, unequal access to resources and differences in institutional capacity. Countries with the highest GERD as a share of GDP are among the top producers of research. However, the only country that experienced a net decrease in the volume of research production between 2018 and 2022 is Equatorial Guinea; this possibly reflects the country's small research system coupled with a small population and GDP. All other countries have witnessed a modest increase in the volume of scientific publications. As will be discussed below, the number of publications is a very

(ongoing), Burkina Faso (ongoing), Cameroon (pilot completed in 2017, full assessment currently ongoing) Chad (ongoing), Cote d'Ivoire (pilot completed in 2016), Mali (ongoing), Niger (pilot completed in 2016), Nigeria (completed in 2019).

partial indicator of research capacity, and particularly of R4D capacity, but one of the few quantitative comparative indicators available to describe a landscape that is slowly changing.

Below we highlight some of the key trends that describe salient changes in the R4D landscape in West and Central Africa.

Trend: Lack of evidence on R4D space

Across most African countries, data on national-level research capacity indicators are generally lacking or, where available, are incomplete, outdated or inaccessible (Chataway et al., 2019). Most existing assessments of the research systems therefore tend to rely on figures that are several years old and do not accurately reflect current situations (Fosci and Loffreda, 2019). Particularly in West and Central Africa, basic information on research funding, the number of researchers in a country, the number of scientific journals or the benchmarking of their quality is sparse for most countries. This is the case even in countries like Nigeria and Senegal which are the top performers in terms of publications on the Anglophone and Francophone sides. This trend is often highlighted for the science, technology, engineering and mathematics (STEM) field, which is at the center of large investments and much policy attention (domestically and internationally). For instance, with the exception of Gabon, Ghana and Burkina Faso, countries in West and Central Africa have only implemented national surveys of their R&D system only once or twice since 2010 (AUDA-NEPAD, 2019). Consequently, it remains difficult to prioritize and target investments and policies accurately, let alone devise evidence-based strategies in support of the sector. It remains also difficult to simply document ongoing changes, or explain changes in the few indicators that are currently being collected. Both national and international actors face the critical gap in data and evidence on the state of the landscape they operate in.

The challenge is particularly large when it comes to the social sciences, for two main reasons. First, no agreed policy framework is in place for the social sciences across the countries in West and Central Africa, including the ones like Nigeria with very large systems (Egbetokun et al., 2020). Second, the limited existing measurement efforts, such as AUDA-NEPAD's African Science, Technology and Innovation Indicators Initiative (ASTII) tend to underplay the social sciences. The efforts of GDN in the field of evidence generation on research systems (Doing Research Global Initiative)[3] are a response to the profound lack of systematic data on the state of national social science research systems. The initiative however is relatively recent, and its coverage of the region is still limited. A concerted effort is needed to scale up and institutionalize data and evidence generation on research systems for R4D, by putting national institutions in charge of national research policy and funding at the helm of this effort. These actors can potentially tap into a growing community of local researchers interested in generating data and comparative analysis of research policy, research funding and infrastructure.[4]

[3] The GDN, through the Doing Research Assessment, contributes towards overcoming the data challenge. So far, the DRA has been implemented or is currently being implemented in Nigeria, Benin, Burkina Faso, Cameroon, Chad and Mali. More DRA studies are needed in other countries, as a thriving local research system, i.e. a system that is capable of locally generating, debating and using research-based evidence in policy processes, is a strategic component of a resilient society and governance system.

[4] A Call for Expressions of Interest run in 2022 by GDN collected applications for the Doing Research programs from 16 out of 34 Francophone countries, with multiple teams applying from the same country on many

Trend: Socio-political changes

Among the specific socio-political changes that shape the R4D landscape, violent conflict and political instability in the region have had significant (though admittedly hard to quantify, see above) impact on funding, careers and research agendas. Political instability in several countries including Chad, Guinea, Mali and Nigeria has spurred a 'prolonged crisis' situation. In these cases, beyond the relocation of research capacity away from flashpoints of violence, access to research resources, particularly funding and collaboration opportunities for researching topics not directly linked to conflict, becomes even more limited than before (Egbetokun et al., 2020), irrespective of the growing needs of local populations and authorities. This trend is strengthened by the recent wave of military coups in West and Central Africa:[5] previous evidence, at least from Nigeria, suggests that research funding, human capital and physical infrastructure for research suffer from these shocks, and require stable, long-term investments to thrive.[6]

Socio-political changes also shape the demand for research coming from national governments, regional policymaking bodies, and international donors. One interviewee highlighted that:

> *The instability that is coming on, you know that in Nigeria, the Boko Haram, in the Lake Chad area, the situation in Mali, Niger, Burkina Faso, all of these [have] far-reaching implications [...] It creates a new landscape for research. We find a lot of people engaged, for example, in security studies, in security research [...], but not other [topics]. (Interview with Dr Abdallah)*

This trend highlights the fluidity of a research landscape that for the most part is not structured around long-term research agenda with well-established institutional homes and frameworks, and that relies to a large extent on short- and medium-term external inputs (in terms of resources and possibly leading questions).

Trend: rising political salience of STI (at the expense of social sciences)

Across West and Central Africa, the number of national and regional policies focusing explicitly on research and its contribution to development is growing, and spillovers from regional to national debates are evident.

In West Africa, since the ECOWAS Policy on Science and Technology (ECOPOST) was adopted in 2012, nine countries (including Benin, Burkina Faso, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, Togo and The Gambia) have created their own national science, technology and innovation (STI) policies. In four of these countries (Ghana, Guinea, Mali and Niger), the policy came after 2015, the most recent being in Niger in 2018 (see Table 5 in Annex 3). Discussions on the UNESCO Open Science Framework had a similar effect, with ongoing policy work on open science in Ghana, Cote

occasions. This is a testament to the existence of a supply of research capacity to fill the current gap. National and international donors face an opportunity to address this in the medium term.

[5] https://www.reuters.com/world/africa/recent-coups-west-central-africa-2022-01-24/

[6] For example, Egbetokun et al. (2020) highlighted several long-term effects of political shocks on the NIgerian research system, viz: loss of autonomy of research institutions, neglect of research funding, weakening of the education sector which led to an academic or research career being perceived poorly, and a massive brain drain.

d'Ivoire and Nigeria,[7] i.e. across Anglophone and Francophone lines. A significant impact of this trend is that research policy and research funding have become a topic in policy debates, in their own right, i.e. *separate from policy and funding for the higher education sector.*

> *I think that for the period [2018-2022], and even outside of it, we can see that our sub-region has been able to institutionalize research for development. And we can look at the positive development in terms of the contributions that we have made to addressing real development challenges in our sub-region: development challenges in agriculture, in healthcare, and in other areas in industry. (Interview with Prof George Essegbey)*

> *Of course, we cannot put all the countries at the same level, some countries are ahead of others, but in totality, in the sub-region of West and Central Africa, there's no doubt that research for development is taking place. (Interview with Prof George Essegbey)*

> *Things are getting better. Now we are beginning to understand that there is a need for structure of research and development, or for structuring research engagement. (Interview with Prof Willie Siyanbola)*

This trend is matched in some countries by an upward trend in budgetary allocations to research, beyond commitments alone. For example, on March 15, 2021, the Nigerian President openly announced a commitment of at least 0.5% of GDP to science and technology.[8] Prior to that, the Nigerian government had created a Presidential Standing Committee on Invention and Innovation. Similar announcements were documented in Ghana.[9]

Social sciences, however, remain marginal to this positive change, including in countries with significant and productive social science communities, such as Nigeria and Ghana. Recent research in Nigeria, for instance, shows that only about 9% of gross expenditure on R&D (GERD) goes to social science research. Not only is the social sciences pathologically under-funded relative to other disciplines (Egbetokun et al., 2022), it is often not on the radar of domestic science councils, funding organizations and other major research actors. GDN's work in Nigeria, Benin, Burkina Faso, Cameroon, Chad and Mali has confirmed a general bias toward the pure and physical sciences adversely affects the funding of social science research, particularly as policy turns to STI for development solutions. This often undermines efforts to work across social and other disciplines.

International donors often play a role in deepening the imbalance between social science research and STEM disciplines, with most of the reported foreign donor funding going to the latter and little support to efforts integrating the two (see, for example, the analysis of UKCDR, 2020). The Science Granting Council Initiative (SGCI) is among the international programs focusing on strengthening

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7 https://www.unesco.org/sites/default/files/medias/fichiers/2022/05/National_and_Institutional_OS_Policies.pdf

8 This took place at the 2021 S&T Expo, an annual event organized by the FMST. See https://www.thisdaylive.com/index.php/2021/03/16/fg-to-spend-0-5-of-gdp-on-research-innovation/; https://punchng.com/fg-to-spend-0-5-of-gdp-on-research-innovation-says-buhari/; https://www.vanguardngr.com/2021/03/well-allocate-0-5-of-our-gdp-to-research-innovation-buhari-2/ and https://dailytrust.com/well-peg-0-5-gdp-for-research-osinbajo.

9 https://tribuneonlineng.com/revealed-how-fg-spent-over-two-trillion-on-research-and-development-in-four-years-with-little-to-show/

national institutional capacity for R4D that has not put social sciences onto its agenda yet, and that (surprisingly) has not taken an open stance on this question.

**BOX 1: Continental and regional initiatives that are relevant to R4D in West and Central Africa**

The AU Agenda 2063, adopted in 2015, expresses the commitment of member nations of the African Union towards the vision of "an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena" (AUC, 2015, p.1). The agenda includes seven (7) key aspirations, the first of which is to realize a "prosperous Africa based on inclusive growth and sustainable development." It is anticipated that by 2063, it will become the norm to find a well-educated and skilled citizenry underpinned by STI for a knowledge society across African countries. All the countries in West and Central Africa are signatories to the agenda, and therefore commit to increased investments in universities, science, technology, research and innovation.

Within the timeline of Agenda 2063, the Science, Technology, and Innovation Strategy for Africa 2024 (STISA-2024) focuses on accelerating Africa's transition to an innovation-led, knowledge-based economy by the year 2024. The strategy envisions that this will be achieved through four pillars, including collaboration within and between states in innovation and entrepreneurship. STISA-2024 recommends the establishment of an African STI Fund (ASTIF) with an emphasis on domestic African mobilization of resources.

Trend: Low implementation capacity drives the deterioration of existing research capacity at individual and institutional level

Positive policy and institutional developments notwithstanding, actual policy implementation is fraught with challenges. As a result, the deterioration of research capacities and facilities started in the 1980s lingers on (Mugwagwa and Banda, 2021). Some key informants added that:

> *Governments have not been able to actually provide the kinds of infrastructure on a continuing basis for research and development institutions to really thrive. Much of what we do have always been in four-year budgets…But research and development, research for development needs a long-time commitment. It needs institutional funding. It needs very consistent financing of both physical and soft infrastructure. (Interview with Prof Banji Oyelaran-Oyeyinka)*

> *…what our government is putting is not what we expect or is not of the level that would be able to propel research for development in a manner that they ought to. (Interview with Prof George Essegbey)*

> *It is true that, in the case of [my country], the Federal Ministry of Education, at least the President of the Republic gives research grants to university lecturers bi-annually. But lecturers on several occasions have had to complement these with their salaries. (Interview with Dr Patrick Ndjobo)*

Expenditure rarely follows budget allocations. The African Union (2007) recommends that each African country should commit at least 1% of their GDP to R&D. ECOPOST, the ECOWAS Policy for Science and Technology makes the same recommendation, and calls for each ECOWAS country to create a national S&T fund which would allocate funds and prizes on a competitive basis (ECOWAS, 2011a, b). Based on latest official statistics at the time of writing, no country in West and

Central Africa comes close to attaining this goal (see Table 1 in Annex 2). In Francophone countries such as Niger, Mali and Benin, the establishment of national research funds in 2010, 2011 and 2012 respectively, predated the current wave, but they are largely inactive or unknown by local researchers.

This long-term trend has taken a toll on the quality of institutions and on research careers. As one interviewee put it:

> *It is quite unfortunate that most researchers in our countries in the sub-region and in Africa are still engaging in basic research just to ensure that they are able to publish papers because they don't have access to infrastructure…your computer is probably sufficient for you to do theoretical conceptualization…(Interview with Prof. Willie Siyanbola)*

INASP's (2023) Voice of Early Career Researcher report, whose global sample is 70% from Sub-Saharan Africa, documents the impact of this trend in three salient findings:

> *[...] Researchers see collaboration as extremely important and are keen to collaborate more, but almost two thirds lack funding and opportunities to do so.*
>
> *[...] 86% of researchers lack sufficient funding. Their top priorities are infrastructure, hardware and software, and funding for training and skills development.*
>
> *[...] Researchers are eager to contribute to science and to make a difference to society by solving real-world problems, but most are assessed by the number of papers they produce, or the journals they publish in, not by wider measures of impact.*

GDN's institutional support programs confirms that even the most established universities in West and Francophone Africa, even when very well connected to peers, lack adequate internet connections, access to literature and access to funding to build the online visibility for their research work. This reality cannot be overstated: working conditions do not only distort incentives for researchers, but hold back existing research capacity, including but not limited to 'reverse brain drain'. GDN's work in Côte d'Ivoire shows that 2500 local PhD holders cannot find employment. One interviewee emphasized:

> *We do not have facilities within the [research system] that attends to the need for researchers to continue to renew their knowledge (Interview with Prof Willie Siyanbola)*

<u>*Trend: research systems lack a coordination agency*</u>

The short-termism of political cycles in the region, typically 4 years, in an environment where there is no guarantee of continuity between cycles, is a major disruptor, but the low capacity of science granting councils and similar agencies to play a coordination role at the level of the research system is a major obstacle. Granting councils and research funds, when they exist, lack a clear mandate, the visibility and the institutional capacity to implement existing policies, inform their evolution, and shape incentives faced by researchers. They fall short of steering research systems forward. Although this is a problem in all countries, it has the greatest impact in the leading countries like Nigeria and Ghana, where research policies or funding initiatives exist (Box 2). According to some of our key informants, this results in a decoupling between activities in different parts of the research system,

with individual researchers or research institutions responding to incentives that come from the regional or international level.

> *What we have found and what should be bridged is that there's a huge gap between local requirements, what societies in Africa require and the little that the university was doing even in those days. (Interview with Prof Banji Oyelaran-Oyeyinka)*

The example of TETFUND in Nigeria (Box 2) aptly illustrates the limitations of 'uncoordinated' but resourceful national systems. Recent initiatives in Niger (Box 3) show the efforts that some countries are making, but with limited success. However, the case of CAMES (Box 4) also shows the concrete potential aligning incentives through policies and institution building can have on the research landscape. CAMES provides a striking positive example of alignment of incentives between training, career advancement, publications, and research culture at the regional Francophone level, with the overall positive impact on academic production. This might support narrowing the gap with Anglophone countries in the coming decade, even if the regional nature of the institutions makes it difficult to strengthen links to local development needs and policies.

**BOX 2: Nigeria's Tertiary Education Trust Fund (TETFUND)**

Some countries have created opportunities for domestic research funding but poor monitoring and evaluation as well as lack of complementary investments means that the allocated funds often dissipate through the system without necessarily making significant impact.

The Tertiary Education Trust Fund (TETFUND) was created by the Nigerian government to, among other things, plug deficits in R&D funding particularly in the tertiary education system within the country. Its mandate involves creating a favorable environment for teaching and research by providing and maintaining essential research inputs (including research personnel, physical infrastructure and funding) as well as supporting the production of research output.

Today, TETFUND is by far the largest public funder of research in Nigeria. Between 2012 and 2019, it disbursed a total of about 6.7 billion naira in its flagship research grants programmes. This is less than the estimated disbursement in 2021 alone—about 7.5 billion naira. Sixty-one percent of all projects funded in 2019 were in STI fields. A typical National Research Fund (NRF) project receives up to 40 million NGN (that is, about 96,000 USD) irrespective of discipline. This amount may be considered too small for rigorous research in certain disciplines that require large and diverse samples or large quantities of imported consumables. Moreover, disbursements are typically inconsistent and untimely.

However, interventions aimed at R&D in Nigeria are often inefficient due to a lack of proper coordination. Direct and indirect stakeholders know very little or nothing about whether most programmes and policies are working. In the few cases where evaluations occur, the findings are not widely disseminated and the wider community remains uninformed about the impact of policies and programmes. In the specific case of TETFUND, it is unclear whether any systematic impact evaluation of its funding programmes has ever occurred. Cases of infractions such as financial fraud and other unethical behaviors have also been reported in connection to recipients of funding from TETFUND.

Moreover, TETFUND's interventions over the years include substantial investments in Nigerian academics employed in public tertiary institutions to undergo postgraduate studies and postdoctoral

fellowships in foreign institutions. Without doubt, such international exposure improves researchers' competence and capabilities but it also comes with an inadvertent challenge. A relatively large number of these trained researchers either do not return to the country after their studies or leave after a brief return. This emigration is occasioned by two major factors: one, foreign-trained researchers tend to be preferred for and are themselves attracted to international opportunities; and two, welfare and infrastructure deficits in the Nigerian public research institutions have a discouraging effect. Consequently, ensuring that human capital investments translate to impact requires complementary investments in the work environment of researchers.

Source: Egbetokun, 2022 a, b

**BOX 3: National research funding and coordination in Niger**

Niger is characterized by a scarcity of national research funds. In this country, there is no national research funding agency. A Support Fund for Scientific Research and Technology Innovation (FARSIT) has been recently set up at the Ministry of Higher Education, Research and Innovation, but remains seemingly dormant. From 2010 to 2014, the Government has created 7 new public universities. However, like the oldest public university (Abdou Moumouni University (UAM), created in 1971), they are facing a lack of public research funds.

To solve the problem of lack of research coordination, two research coordination centers (CNRS and CNRA) have been created in 2015. CNRS is aimed at coordinating the overall research in the different fields, while CNRA is focused on the coordination of research in Agriculture.

Source : Marou Sama, K. (forthcoming)

**BOX 4: Role of CAMES in research production**

The African and Malagasy Council for Higher Education (CAMES) is a voluntary regional organization bringing together 19 West and Central African countries (Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Gabon, Guinea, Guinea Bissau, Madagascar, Mali, Niger, Rwanda, Senegal and Togo). Created in 1968 in Niamey (Niger), CAMES is in charge of ensuring the evaluation of both research institutions and academics/researchers from these countries. It operates as a regional agency, and institutions and countries pay a fee to guarantee its functioning, which regulates career advancement in most of the member countries.

The number of publications is one of the most important criteria used by CAMES to evaluate academics/researchers for their career advancement. To satisfy this criteria, they have to publish more. CAMES encourages researchers to publish in international journals, i.e. journals managed from countries other than those in which researchers are affiliated. Despite pre-existing (and now parallel) national evaluation systems for research in some of the member countries, CAMES has emerged as a reference in the region (not without discontents, particularly regarding the adherence to 'flawed' Northern notions of excellence in its own work). It has been able to establish a reputation for rigor, and its evaluation work allows the academics/researchers it certifies to be credible on an international

scale.

CAMES is a remarkable example of what a coordination initiative can do to align incentives and boost research production. In some of its Francophone member countries (such as Burkina, Senegal, Cameroon, Niger and Benin), it explains the increase in the scientific production observed in recent years.

Source: Marou Sama, K., 2016, 2018.

Trend: Continued reliance on external sources of research funding, and the race for credibility in the eyes of international donors

Domestic funding for research in West and Central Africa comes mostly from governments but it is often limited in volume and flow (Egbetokun et al., 2022). As a result, individual researchers and research institutions invest significant resources to access competitive international funding to pursue their research activities. Despite no clear data or systematic data on funding flows, this is a well-established trend. One of our KII commented it in the following words:

> *One of the things you notice is that in the practice of the research for development across all the sectors (agriculture, health and industries), we always have to have collaboration with external agencies to be able to address the challenges that we have. On one hand, we can say that it is a positive development, there is so much goodwill and willingness to collaborate with our research institutions and so we are able to get things done. But on the other hand, it also shows a kind of dependency that we ought to be avoiding or we are not avoiding, but we ought to be growing out of. (Interview with Prof George Essegbey).*

This trend affects equally Anglophone and Francophone Africa. In a recent study related to African research and international funding, Francophone Africa researchers surveyed emphasized that international funding provides them with good opportunities to conduct research and publish. However, they also criticized the strategies of some international donors who do not sufficiently listen to researchers and institutions in the South. In addition, they mentioned that research is oriented towards international donors' interests (Marou Sama et al., 2019).

If international funding is an essential brick of the R4D landscape, it poses two main challenges: domestic researchers and policy institutions have limited capacity to shape the research agenda and defining funding priorities of foreign donors; significant resources are invested in building long-term and exclusive relationships with international donors, who are themselves often looking for trustworthy and capable grantees in a landscape they have limited knowledge of. These trends incentivize the alignment of domestic research agendas with donors', and competition at the expense of collaboration (Egbetokun et al., 2020).

This trend translates in the proliferation of think tank-like structures (often perceived as an easier research partners compared to public universities), the phenomenon of over-commitment of 'R4D champions' (these often develop roles as research capacity building and incubation agencies themselves, monitoring and evaluation outfits, and consultancies - this is the case of high-capacity regional organizations such as ACTS-Africa, IPAR and ACTS), and the phenomenon of the 'revolving door' in human resources, with people moving from research institutions to local offices of

international agencies. Driven by a donor community in constant search for grantees they can trust, the impact of these market distortions on the landscape is understudied, but anecdotal evidence suggests a mix of hyperspecialization, complacent gatekeeping, and mission drift towards specific evidence work that does not relate to research agenda setting or research (such as M&E).

In this regard, it is critical to avoid the 'Matthew effect', a situation where the strongest countries or actors, being more attractive to donors and other partners, continue to draw attention and become increasingly stronger (becoming, in the worst case scenario, gatekeepers of international funding and a factor in growing inequities) while the weaker ones are left behind.

This point was highlighted by one of the interviewees:

> *You should consider two issues. One is, when you want to partner, you want a strong partnership, right? So, you need someone who is up to the mission. But at the same time, if you are engaging in the development field, you need to look at the capacity building dimension of the process. So, you may have weak partners in the country, but the outcome or the impact will be much higher if you work with this weak local institution and build their capacity through your collaboration, thereby making them more attractive, to a certain standard. And this will live even beyond your research project. This has a developmental impact and it is something that should be encouraged. (Interview with Dr Soulleymane Abdallah).*

*Trend: health research leads investments in research*

Across all the countries in the region, research is heavily concentrated in the so-called hard sciences, but a strong focus on health-related research is obvious from a look at research output. This focus is explained, as we found from the interviews, by the strong relevance of health to the wellbeing of the population in the tropical countries and by different funding architecture (domestic and international):

> *Health research is fundamental because if you are talking about the disease conditions in our tropical West and Central African region, the way we address the health challenges, the prevalent diseases in our region is of importance to our practice of research for development. I would say that we are making strides; we have medical research institutes established and we have specialists in these research infrastructures (Interview with Prof George Essegbey)*

More narrowly, health research attracts a significant share of available resources, even from international donors. The UK government and Wellcome Trust alone spent globally £873 million between 2016-2021 on dedicated research capacity strengthening initiatives in health, with a further £1.2 billion expended on research activities with a capacity strengthening component. No figure for any other field comes close to this one.[10] At the regional level, recent analysis by the UKCDR (2020) shows that UK's R&D investments in Nigeria was biased towards the health sciences, even before the COVID-19 pandemic. Particularly in the aftermath of the Ebola and COVID-19 crises, many countries in the region have developed capacity in health-related research. This capacity reflects, first and foremost, in the evolution of research output across countries. Specifically, the countries most affected by the Ebola outbreaks in 2014 (Guinea, Liberia and Sierra Leone) have experienced the most rapid rise in research publications in the clinical sciences (UNESCO, 2021). The capacity also

[10] UKCDR. UK funding landscape for research capacity strengthening in low- and middle-income countries: briefing paper, October 2021. London: UK Collaborative on Development Research, 2021.

reflects in the emergence of new research organizations and initiatives or the strengthening of existing ones. Mobula et al. (2020) describe systems that were put into place during the Ebola Virus Disease (EVD) response in the DRC that can be leveraged for the response to the current COVID-19 global pandemic.

Some of these initiatives include the creation of laboratory networks for rapid testing, diagnosis and genome sequencing of new diseases. For example, the ACE in the Genomics of Infectious Diseases (ACEGID), based at the Redeemer's University in Osun State, is at the forefront of Nigeria's public health programme. The ACEGID laboratory provided much-needed genome sequencing, testing and diagnosis in the fight against the Ebola and COVID-19 viruses (Egbetokun et al., 2020).

Importantly, the health capacity and initiatives that some of the countries developed during health crises tend to spill over to other parts of the research system, including the policy space and the private sector. In the DRC, for example, local authorities collaborated with several technical and strategic partners such as the WHO, UNICEF and a number of nongovernmental organizations to develop a comprehensive response program to the Ebola virus outbreak. Some of the systems developed and implemented during that outbreak remained available for policymakers to leverage during the COVID-19 global pandemic (Mobula et al., 2020).[11] Spillovers to the private sector are in the form of emerging capacity for the production of vaccines, test kits and sanitation equipment appearing in countries like Ghana and Nigeria. Virtuous spillover effects from health to the broader R4D field are visible, and could be leveraged further by both domestic and international donors.

*Trend: The exclusion of women from research careers*

In Central and West Africa, although many women are enrolled in universities, only a handful pursue research careers. In most countries in the region, the proportion of women in research is below the regional average of 29% and the global average of 30%. In Senegal, for example, the proportion is 17%, compared to 11% in Togo and (8%) in Guinea (UNESCO, 2015). Women are also under-represented in academic bodies and research structures, where there are few women research directors, professors, heads of laboratories, institutes or universities (Marou Sama, 2016, 2018; Tremblay, 2001, 2002, 2003). The implication is that with fewer positions of responsibility, women could not participate in institutional decision-making and therefore cannot integrate the gender dimension into the research ecosystem. These inequalities are exacerbated by socio-cultural constraints, religion and self-censorship, which act as bottlenecks to the implementation of gender equality policies and their institutionalization in higher education institutions (Marou Sama, 2016, 2018). Other challenges that continue to hinder the institutionalization of gender policies include lack of understanding of the concept of gender, denial of inequalities and resistance to change.

These disparities affect the role of women in research and create inequalities in the production of research among women. Due to the gendered division of labor, women in Central and West Africa are less likely to engage in time-consuming and resource-intensive research. However, research

[11] These include the deployment of experts to implement readiness activities; training of rapid response teams to investigate alerts in non-affected health zones; mentorship in health centers; and identification and equipping of isolation facilities in designated health centers.

funding programmes do not take into account what sociologists have called women's "double workday", which includes both income-generating work for themselves and the household or domestic work (Meintel et al., 1985). For women researchers, marriage and motherhood represent an additional burden of work and stress that is not taken into account in their career plans. They progress slowly in research when they have family lives, and are often victims of burnout and depression as they try to keep up with the frantic pace of men who are not subject to the same social and academic family pressures. Research systems reproduce the same social inequalities, often consciously or unconsciously, so it is important to study these forms of inequality and their impact on women's research.

### *Central and West Africa's R4D landscape: Country typologies*

We classify the countries in the region based on the impact the trends highlighted above manifest themselves, and based on the current performance of their R4D systems (understood through the limited lens of publication output). We propose 3 main groups:

*a. Relatively advanced research systems: Senegal, Ghana, and Nigeria*

These three countries host some of the top and best established academic institutions in the region, they rank high in the region in terms of publications output, produce generations of qualified researchers, and attract significant donor funds. At the same time, the lack of coordination, in the form of a performing and empowered agency capable of linking funding, research policies and research agendas, hampers the evolution of the research system and alignment between national priorities and ongoing R4D efforts.

According to the ranking of African universities done by Uniranks[12], University of Ghana and University of Ibadan (Nigeria) are at the top in West and Central Africa. Cheick Anta Diop University (Senegal) is the best ranked one in Francophone Africa. Many strong think tanks operate in these countries, and can deliver close to any analysis for governments and donors, with methodological sophistication. In terms of the number of researchers per million inhabitants, Senegal is the strongest country in this region with 983 researchers per million inhabitants in 2018 according to UNESCO's data. In 2015, the number of researchers per million inhabitants was 564.3 in Senegal and 89.1 in Ghana (Table 1). Data on Nigeria dates back to 2009 estimations, with 39 researchers per million inhabitants, based on 2007 data collection by NACETEM.

Universities in Senegal however still lack systematic access to bibliographic databases and high-speed internet. Research activities in universities and research centers in Nigeria suffer from the ongoing conflicts between universities and ministries over funding and human resource policies. In Ghana, some of the best performing institutions are overwhelmed with contracts from international agencies. In all three countries, the potential development of the research system is hampered by the temporary solutions researchers and research outfits individually find to advance their own trajectory, in the absence of stronger coordination and awareness about the organic system in which they operate.

[12] Uniranks - Africa University Rankings

*b. Fast emerging research systems: Cameroon, Burkina Faso, Niger, Côte d'Ivoire, and Benin*

The countries in this category show significant upwards trends in the number of publications, reflecting a dynamic research environment, particularly in Francophone Africa. The number of researchers and research institutions remains low in some countries (Niger), and in others the new generation of researchers often find it difficult to find employment, with the sector having limited absorptive capacity (GDN, 2016a). In an illustration of the uncoordinated development of the research sector in Cote d'Ivoire, GDN came to learn through its work that up to 2,500 local PhD holders are currently unemployed.

In these countries, despite the existence of strong universities, many researchers and many donors prefer doing R4D through administratively lighter structures such as think tank-like outfits, with different degrees of formality (a regional think tank like LASDEL is a reference in the region, but there is a proliferation of informal think tanks, set up by researchers who do not feel empowered to conduct research and enabled to access funding through their academic affiliations).

Most of these countries lack a functional research council or other coordination agency at the level of the system, which would be key to orient the timidly upward trends and institutionalize the sector further.

*c. Research systems lagging behind: Guinea, Congo, Democratic Republic of Congo, Mali, Chad, Mauritania, Sierra Leone, Gambia, Togo, Central African Republic, Guinea-Bissau, Cabo Verde, Gabon, Liberia, Sao Tome and Principe, and Equatorial Guinea*

Unlike countries in the other categories, the lack of institutional frameworks for research, science policies and funding in these countries is holding back generations of researchers, despite some limited exceptions (the DRC, for example, started collecting data on the research system, unlike most countries in the categories above). Capacity to use the evidence to develop policies remains very limited. In these countries, international research funding remains key for R4D, but it is often biased towards health and security topics, and the number of researchers trained to doctoral level domestically, as well as the volume of research outputs, remains very low. Importantly, these include some of the countries facing the hardest political uncertainty in the region, and in which development and security challenges, along with climate change impacts, are compounded, virtually making policy-relevant research-based evidence all the more critical.

## *Central and West Africa's R4D landscape: Actor typologies*

A healthy research system will, at least, have a broad range of actors with varying levels of capacity and impact. These typically include:

1. Higher education institutions – comprising federal, state and private universities
2. Government and funding agencies – comprising foreign donors, local donors, regulators, national agencies, national ministries and research institutes
3. Private sector organizations – comprising for-profit think tanks and consultancies as well as businesses that hire researchers

4. Civil society organizations – comprising non-governmental organizations (NGOs), opinion leaders, non-profit think tanks and the media (GDN, 2017)

All of these actors are present in West and Central Africa but there are remarkable cross-country differences that add up to differences in national research capacity. This creates a complex research landscape that is *under documented and under researched, but constantly evolving*. The literature and key informant interviews however provide a useful snapshot of the current situation.

1. International institutions play a major role in funding and conducting research first-hand in the region. Some of the most important international institutions involved in research in West and Central Africa include the World Bank, the International Monetary Fund (IMF), the United Nations Economic Commission for Africa (UNECA), and the African Union Commission (AUC). These institutions have access to significant resources and expertise, and they can reach a wide audience with their research findings. However, they can also be bureaucratic and may not be as responsive to local needs as other actors. They often commission research that responds to their own internal corporate knowledge needs, feeding a sector of consultants dedicated to this.

2. Sub-regional institutions also play an important role in research in West and Central Africa. Some of the most important sub-regional institutions involved in research in the region include the Economic Community of West African States (ECOWAS) and the Economic Community of Central African States (ECCAS). These institutions coordinate research activities, promote collaboration between researchers, and facilitate the exchange of knowledge. They are well-positioned to understand local needs and to build relationships between researchers. However, they may not have the resources or expertise of international institutions.

3. National institutions are important actors in research in West and Central Africa. Some of the most important national institutions involved in research in the region include universities, think tanks, and government agencies including policy organizations. These institutions conduct research, train researchers, and disseminate research findings. They are well-positioned to understand local needs and to build relationships with communities. However, they may not have the resources or expertise of international or sub-regional institutions. The capacity of some of these institutions has also deteriorated significantly over time, due to long-term under-funding. An interviewee provides an example of this:

   > *Nigeria in the 80s used to actually [...] to supply almost all the animal vaccines across West Africa. Today. You would have imagined that if the infrastructure, manpower, the skills, knowledge, energy had been cumulatively applied over time, by now, we would have been in a situation where we are also able to make human vaccines. (Interview with Prof Oyelaran-Oyeyinka)*

4. To a lesser extent compared to the above groups of actors, the civil society and the private sector play some roles in the R4D landscape in West and Central Africa. Partly due to their complexity and the lack of data, the role of the civil society is a bit unclear but some activity

seems to be present in the sector. GDN-NACETEM (2020) reported the presence of some non-governmental organizations (NGOs) in Nigeria that some organizations that actively produce or diffuse SSR, in addition to being users of research findings. It is common to find such 'outlier' NGOs existing alongside several others that operate on a very small scale and are barely visible in the research space. Similar to the NGOs, the lack of reliable data makes it difficult to assess the role of the private sector but the KIIs suggest that there are pockets of activity and significant opportunities:

> *Many African countries over the time simply set up research institutes and then they couldn't fund them. So now we need to turn it the other way around. We need to support local firms in ways that they are able to have stronger collaboration with public research institutes…I always say that the locus of production is the firm. That's where everything happens. And that's what we have neglected the most (Interview with Prof Banji Oyelaran-Oyeyinka)*

> *In totality, what the entrepreneurs do, it contributes to either enhancing research or development in our sub-region or even inhibiting it. (Interview with Prof George Essegbey)*

Within the broader private sector and civil society sector, there has been a proliferation of organizations that take the form of think tanks, either government-owned or private. These think-tank-like structures, particularly the private ones, are often perceived as more independent, transparent and free from needless bureaucracies. They therefore appear more attractive to international donors as an easier platform to conduct research.

**Conclusion: Opportunities and Implications**

The research landscape in the West and Central Africa region is vast, diverse, but also split between a new policy dynamism and the limitations of a 'shallow' institutionalization of R4D. Lack of systematic data and evidence on the changes underway complicates the task of identifying challenges and in particular opportunities. The gap between policies and resources, between research capacity and its deployment, between large and small countries, and between sub-regions, not least across Anglophone and Francophone divide, remains anecdotal and scantily documented, making evidence-based support to the sector hard to implement. In a scenario where international funding remains key, however, IDRC can play a very significant role and pursue a wide range of goals.

**Boosting the collection and analysis of data and evidence on the R4D landscape** in itself will have a transformational effect on the sector. A generation of capable local scholars is interested in making a critical contribution in this respect.

Supporting the **generation of policy relevant evidence** on themes of IDRC's interest can support the need for deepening institutionalization if the modalities of such support incentivize local institutions to build long-term research agendas, as opposed to delivering projects and papers. A focus on research agendas will attract different actors to the IDRC network of grantees. It will also support research careers, and young researchers in particular, and might also generate the space to engage with the private sector over longer timelines, around specific themes and the work of local institutions.

**Strengthening R4D systems** will require working even more with science granting councils. Support to these institutions should aim to boost their capacity to coordinate the national research system, shape incentives for local researchers, negotiate partnerships, inform policy implementation with data and evidence on the state of the R4D landscape, on top of preparing them to receive and manage national and international funds. Further, an initiative such as the SGCI should take a stance on the essential place social sciences have in STI on the continent.

Finally, IDRC could play a key role, at the global level, in advocating for a change in the **rules of the publishing sector,** to open access to scholarly knowledge, which remains (unjustifiably) an issue even for the strongest institutions in the region, and a handbrake on the development of the sector.

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## Annexes

### *Annex 1: Background and Basic Definitions*

### A. Background

Since its establishment, the International Development Research Centre (IDRC) promotes and funds research and innovation in and with developing regions to advance global change as part of Canada's foreign and development policy. IDRC invests in high-quality research in developing countries, shares knowledge in support of uptake and use, and leads international alliances to create a more inclusive and sustainable world.

In 2021, IDRC began implementing its new Strategy 2030. The Strategy 2030 document outlines the Centre's plans for a 10-year period. Every three years, beginning in 2023, IDRC plans to conduct a strategy check-in to reflect on progress to date and to inform its implementation strategy. As part of the first strategy check-in, IDRC commissioned studies on the current research-for-development (R4D) landscape in each of the five IDRC regions (East and Southern Africa, West and Central Africa, Middle East and North Africa, Latin America and the Caribbean, and Asia).

The Central and West Africa Regional Office (WARO) commissioned the Global Development Network (GDN) to undertake this exercise for its region of competence comprising 24 countries and territories. These include: Senegal, Ghana, Nigeria, Burkina Faso, Cameroon, Cote d'Ivoire, Benin, Democratic Republic of Congo, Congo, Niger, Togo, Guinea, Sierra Leone, Mali, Chad, Gambia, Central African Republic, Guinea-Bissau, Mauritania, Cabo Verde, Gabon, Liberia, Sao Tome and Principe and Equatorial Guinea.

### B. Defining Research-for-Development[13]

As a phrase and as a concept, R4D is more widely used among international development donors that fund (through ODA) research in Lower Middle Income Countries than by the researchers and research institutions themselves. In this sense, the R4D describes efforts to link research to development locally, *and* the international sector that funds this work, of which IDRC is a key player. Bringing these two sectors together are specific expectations regarding the role research can (or ought to) play in larger processes of socio-economic development, even if these expectations (including diverging positions) are not always articulated and debated. This implies that the R4D landscape is influenced by both the politics of ODA and international cooperation at the regional level as much as it is influenced by (multiple) local debates on the place of evidence in development policy and practice.

*R4D in the words of researchers*. In the academic literature, research-for-development (R4D) is described as research aiming to benefit developing countries, or rather the development of these countries. More specifically, David (2021, para 2) defines R4D as "research that seeks to find solutions to poverty and bring about social, economic and political development in the Global South". This suggests that R4D is an explicit attempt to reframe research with a developmental perspective - to go beyond knowledge production and to include attention to the use of **research to achieve development impacts** (or, alternatively, to place research results within development processes). This ambition **shapes expectations regarding research process,** and in particular regarding production, dissemination and use functions as being equally at play in R4D efforts (GDN, 2020). In line with this understanding, Hall (2013, p. 1) defines R4D as "an engagement process for understanding and addressing development challenges defined with stakeholders. Stakeholders are

[13] A version of this text was included in the twin report prepared for IDRC's Asia Regional Office (ARO). Its validity is general.

champions and partners in the research process as well as the change it aims to bring about." In other words, the focus of R4D is strongly on 'applied' research, and in particular research that is generated, conducted and typically shared with other development actors, i.e. non-researchers, in support of policy and practice.

*IDRC's take on R4D*. The IDRC Act of 1985[14] defines IDRC's focus on 'research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions' (1985). It is problem-focused and action-oriented, creatively identifying and engaging with relevant users of knowledge and innovation to ensure that research is relevant and positioned for use in policy and practice (IDRC, 2023). To this end, the Centre embraces a number of strategies, spanning investing in talent, supporting Southern-led capacity building, enhancing collaboration and coordination at the international level (see IDRC Act, par. 4.1 a-d). The attention to research use, as well as collaboration and coordination as priority areas is also clear in IDRC's Strategy 2030, which commits the Center to "be a leader in research for development, **investing in high-quality research and innovation, sharing knowledge and mobilizing alliances** for more sustainable, prosperous and inclusive societies" (IDRC Strategy, 2030, p. 4, emphasis added).

In sum, as IDRC implements its mandate and strategy, seeking both impact and visibility, it must grapple with the evolution of research systems and their drivers, and with the changing space and role international donors can play in it (cf. Apgar et al., 2023 and Currie-Alder, 2014).

## *Annex 2: Methodological Notes*

### A. Methodology

While the geographic scope (see Fig. 1) encompasses multiple established regional economic communities, such as UEMOA and ECOWAS, (in other words, this is not a 'region' only for IDRC), it also remains a vast and diverse one. Nigeria, which is the most populous country in the region, has twice as many residents as the Democratic Republic of Congo, which is the second most populous country in the list. The two largest economies in GDP terms are Nigeria and Ghana; but in 2021, Nigeria's GDP was nearly six times that of Ghana. Universities and think tanks in the region are concentrated in a few countries, mainly Nigeria, Ghana and DR Congo (see Table 1). Most countries in the region are much smaller in size, but yet they have a distinctive history and specificities when it comes to research capacity and its drivers. GDN therefore proposes to discuss common trends in light of significant and persistent differences between countries in the region.

[14] https://laws-lois.justice.gc.ca/eng/acts/i-19/fulltext.html


**Figure 1: Map of West and Central Africa**
Source: Papworth et al, 2013

To this end, and to extract operational implications of the analysis within the brief length of this report, we propose to add an intermediary but key analytical step, namely the **grouping of countries in the region by the differential impact of the macro regional R4D trends discussed in the report.** Ultimately, this leads to the definition of country typologies that can hopefully support IDRC's strategic reflection and operations going forward (and as long as the trends on which the typology is built remain relevant).

Data were collected through a desk-based review and key informant interviews (KIIs). The desk-based review focused on gray and academic literature. The note draws heavily on the ongoing work of the Global Development Network (GDN)'s Doing Research global initiative and the Doing Research Assessment, which has been implemented (to different degrees) in the countries such as: Benin (ongoing), Burkina Faso (ongoing), Cameroon (pilot completed in 2017, full assessment currently ongoing) Chad (ongoing), Cote d'Ivoire (pilot completed in 2016), Mali (ongoing), Niger (pilot completed in 2016), Nigeria (completed in 2019). The Doing Research global initiative is the first attempt to generate systematic comparative evidence on the state of research systems in low and middle income countries, with a specific focus on applied social sciences.

**Table 1: Basic characteristics of countries in West and Central Africa**

| | Population in 2021 (million) | GDP in 2021 (billion US$, current) | Researchers (FTE) in R&D per million (latest year available since 2010) | GERD as % GDP (latest year available since 2010) | Universities | Think tanks |
|---|---|---|---|---|---|---|
| West Africa | | | | | | |
| Benin | 13.0 | 17.1 | | | 11 | 18 |
| Burkina Faso | 22.1 | 19.7 | 47.6 (2010) | 0.25 (2020) | 12 | 21 |
| Cabo Verde | 0.6 | 1.9 | 123.5 (2014) | 0.07 (2011) | 6 | 3 |
| Cote d'Ivoire | 27.5 | 70.0 | | 0.07 (2016) | 25 | 19 |
| The Gambia | 2.6 | 2.0 | 52.9 (2018) | 0.07 (2018) | 1 | 6 |
| Ghana | 32.8 | 77.6 | 89.1 (2015) | 0.45 (2017) | 50 | 40 |
| Guinea | 13.5 | 16.1 | | | 27 | 2 |
| Guinea-Bissau | 2.1 | 1.6 | | | 3 | 1 |
| Liberia | 5.2 | 3.5 | | | 7 | 4 |
| Mali | 21.9 | 19.1 | 58.3 (2019) | 0.16 (2019) | 6 | 14 |
| Mauritania | 4.6 | 10.0 | | 0.01 (2018) | 2 | 8 |
| Niger | 25.3 | 14.9 | 26.5 (2013) | | 6 | 19 |
| Nigeria | 213.4 | 440.8 | | | 118 | 52 |
| Sierra Leone | 16.9 | 27.6 | | | 3 | 4 |
| Senegal | 0.2 | 0.5 | 564.3 (2015) | 0.58 (2015) | 14 | 22 |
| Togo | 8.6 | 8.4 | 45.6 (2020) | 0.27 (2014) | 5 | 9 |
| Central Africa | | | | | | |
| Cameroon | 27.2 | 45.3 | | | 20 | 22 |
| Central African Republic | 5.5 | 2.5 | | | 2 | 2 |
| Chad | 17.2 | 11.8 | 57.9 (2016) | 0.3 (2016) | 7 | 3 |
| Congo – Brazzaville | 5.8 | 13.4 | | | 1 | 3 |
| Congo DR | 95.9 | 48.1 | | | 60 | 8 |
| Equatorial Guinea | 1.6 | 12.3 | | | 1 | * |
| Gabon | 2.3 | 20.2 | | | 6 | 2 |
| Sao Tome & Principe | 8.4 | 4.0 | | | 1 | * |

Sources: Economic and R&D data from World Development Indicators, updated 30 March 2023; Universities from World Higher Education Database, https://www.whed.net/results_institutions.php; Think tanks from McGann (2018)

Key Informant Interviews (KIIs) were conducted with experts familiar with the regional R4D landscape. KIIs were conducted online with six senior experts from across the region, from a mix of organizations (universities, research institutes, think tanks and multilateral development organizations) active at the regional level in the R4D space - see Annex 3 for categories of KII respondents. In brief, the KIIs were obtained from the Center for Energy Research and Development, Nigeria; Department of Economic Analysis and Policy, University of Maroua, Cameroon; Science and Technology Policy Research Institute, Ghana; African Development Bank, Ivory Coast; United Nations Economic Commission for Africa, Ethiopia and the think tank IPAR, Senegal. The KIIs generated insights that helped broaden and deepen the analysis based on desk-based review, and the expertise of the report authors – see Annex 2 for KII protocol.

The authors applied established protocols for data analysis, which included synthesis of themes and categories, and interpretation (Charmaz & Belgrave, 2014). The continuous comparative method of

analysis, in which data were repeatedly compared with each other throughout the synthesis process, was used to analyze both primary (interview) and secondary (document) data. The process was iterative and inductive.

**B. Key Informant Research Interview Protocol**

KIIs lasted between 30 and 60 minutes and were structured around the three (3) main guiding questions included by IDRC in the ToR for the study. The KII protocol was developed to facilitate the interview process as well as note taking and summarizing the discussion.

**Script for Key Informant Interviews**

- *Introduction*

- Thank you for accepting to provide your insight.

- The interview should last around 60 minutes, and it will focus on a number of questions we are trying to answer for a rapid study commissioned by Canada's International Development Research Centre. The study is titled '*analyzing the regional research-for-development landscape*'.

- You are one of 5 people we have identified as key informants, and we would like to use this conversation to discuss with you the factors, actors and trends shaping the space for research for development in West and Central Africa. The region is defined based on IDRC's list of focus countries, and includes Benin, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Congo – Brazzaville, Cote d'Ivoire, Equatorial Guinea, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Sao Tome & Principe, Senegal, Togo.

- We will be recording the conversation, and we might extract direct quotes to enrich the final report. We ask you to please flag any piece of information you would like us to treat as confidential, in case you would like to exclude it from possible direct quotes, or if you would like us to anonymize it.

- We thank you in advance for your time and support. We are hoping that this report will help IDRC in strategizing its work in the region, to support local researchers, contribute to strengthening institutions and local research systems.

- *Background to the Study*

- The study is concerned with understanding the way the research landscape is structured across the region, who inhabits it, and how it is evolving, in terms of both advances and challenges, with a focus on the period 2018-23.
- IDRC defines 'research for development' as high-quality research and innovation carried out in developing countries, its diffusion and its use.
- In the literature, the phrase 'research for development' usually describes efforts to use research tools and methods to illuminate and address development policy challenges. We are therefore referring to 'applied' research, and specifically (at least partly) research that originates in interactions with, is conducted with, and typically is shared with *other* development stakeholders, i.e. non-researchers, in support of policy and practice.
- The space this kind of research has depends on a number of factors: from individual capacity, to institutional mandates and resources, including funding, academic freedom and the level and relationships that exist between researchers and development stakeholders.

- *Interview Questions*

Question 1:

- The first question we have for you is: What is your impression about the development of research, and R4D in particular, in your country/region over the last five years (2018-2022)?

Question 2:

- How would you describe the opportunities and the challenges facing this research space, in recent years? Which ones would you consider the top three 'shifts' or 'trends'? Think about both positive and negative trends. Please remember we are interested in production, diffusion and use, not only in production of research.
- Could you give us one or two concrete examples of how these trends shape the work of researchers, by focusing on a country, an institution or a project you know well?

Question 3:

- Who are the key actors in the scenario you describe above?
  If needed, prompt for these: universities; think tanks; government; major NGOs that conduct R4D]
- Which ones of these are directly or indirectly opening up for research, and which ones are contributing to closing it down?

Question 4:

- Now, can you choose a few actors that you think make the most difference (negative or positive) for research, and tell us more about their strengths and weaknesses, from your point of view?

- *Conclusion*

- Many thanks for your time and answers. Would you be available for a follow-up interview, if needed?
- Finally, do you have any questions or suggestions for us?

**C. Categories of KII Respondents**

| S/N | Informant Name | Institution | Country | Date of interview |
|---|---|---|---|---|
| 1 | Prof George Essegbey | Science and Technology Policy Research Institute | Ghana | 13 April 2023 |
| 2 | Dr Patrick Ndjobo | Department of Economic Analysis and Policy, University of Maroua, Cameroon | Cameroon | 14 April 2023 |
| 3 | Prof Willie Siyanbola | Centre for Energy Research and Development, Nigeria | Nigeria | 22 April 2023 |
| 4 | Dr Soulleymane Abdallah | United Nations Economic Commission for Africa, Addis Ababa | Ethiopia | 26 April 2023 |
| 5 | Prof Banji Oyelaran-Oyeyinka | African Development Bank | Ivory Coast | 04 May 2023 |
| 6 | Cheik Oumar Ba | Executive Director of the Initiative Prospective Agricole et Rurale (IPAR) | Senegal | |

## *Annex 3: The R4D Landscape in West and Central Africa*

### A. The R4D Environment

Previous research suggests that economic and political stability affect the production, diffusion, and uptake of research. The rate and direction of research as well as the freedom that researchers have are all influenced by the political instruments of the state and the fiscal commitments from stakeholders, including government (NACETEM and GDN, 2020). In this sense, the countries of West and Central Africa show considerable heterogeneity. Table 1 provides some economic indicators for these countries.

#### *Economic context*

Comparatively, West African countries are economically larger and more resilient that their Central African counterparts. In 2018, average annual growth of real GDP in West Africa was around 5% and only one country, Liberia, experienced negative growth. In contrast, average annual GDP growth in Central Africa was only 1.1% in 2018 and two countries—Congo and Equatorial Guinea experienced negative growth. By 2020 in the height of the COVID-19 pandemic, only Guinea in West Africa came close to 5% real GDP growth while six countries experienced a decline. Notwithstanding, most of the countries have resumed an annual real GDP growth of about 5% in 2021.

Conversely, GDP in Central Africa declined at an average of 1% in the height of the pandemic in 2020. With the exception of Sao Tome and Principe that showed exceptional GDP growth of 3.5%, growth in all the countries of Central Africa slowed down considerably. While all countries had resumed positive growth, the negative growth in the wake of the pandemic persisted in Chad, Congo and Equatorial Guinea.[15]

#### *Fiscal context*

As of February 28, 2023, most Central African countries were either in debt distress (Republic of the Congo, São Tomé and Príncipe, and Chad) or were in high risk of being in debt distress (Central African Republic, and Cameroon) (IMF/WB, 2022). In 2020, the increase in general government gross debt for Central African countries was 7.9% of GDP on average, after which several went into arrears. In contrast, no country in West Africa was in debt distress at the time and only a few (Gambia, Ghana and Guinea-Bissau) were in high risk of debt distress.[16]

#### *Political context*

West and Central Africa is increasingly facing political instability and armed conflicts, which have negative consequences for research (Touré, 2003). For instance, there have been coups, coup attempts or armed conflicts in Burkina Faso, Central African Republic, Gabon, Gambia, Guinea, Guinea-Bissau, Mali, Nigeria, and Sao Tome and Principe between 2018 and 2022. The negative impact of these on research range from forced displacement of researchers, brain drain, destruction of the limited infrastructure, to further limitations to research funding. For instance, the insecurity associated with the Boko Haram insurgency in the north-eastern part of Nigeria deters researchers from doing research in this region (NACETEM and GDN, 2020).

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[15] World Development Indicators, World Bank, https://data.worldbank.org › NY.GDP.MKTP.KD.ZG.

[16] List of LIC DSAs for PRGT-Eligible Countries As of September 30, 2022. Retrieved from Debt Sustainability Analysis (DSA): www.imf.org/external/Pubs/ft/dsa/DSAlist.pdf

### *Organizational capacity*

Across all the countries in West and Central Africa, several organizations undertake research. However, these organizations are generally small in size and scope, and they typically rank poorly on global assessment indicators. For instance, in the 2017 Go-To Global Think Tank Report (McGann, 2018), only 3 think tanks in the entire West and Central African region were among the top 150 non-US think tanks; in contrast, South Africa alone has four and Ethiopia has three. Only 3 think tanks in West and Central Africa ranked among the top worldwide, compared to six each in Southern and Eastern Africa. Of all 242 think tanks in West Africa, only 33 (16%) were among the top 90 in sub-Saharan Africa. The share is even lower in Central Africa where only 7% of 44 think tanks were among the top in sub-Saharan Africa (Table 2).

Similarly, the Times Higher Education (THE) ranking[17] indicates that of all West and Central African countries, only Ghana (3 universities) and Nigeria (12 universities) have universities ranked in the top 100 in Africa. Altogether, the limited size, scope and weak global performance of the research organizations imply limited influence and geographic reach. For instance, according to the THE ranking, with the exception of one university each in Ghana and Nigeria, the best-ranked universities in West and Central Africa have neither international faculty nor foreign students.

### *Funding*

R&D funding is poor across all countries in West and Central Africa, leaving the research organizations to be heavily dependent on external funding. Available data (Table 1) shows that the countries generally invest far below 1% of their GDP in R&D, with little expectations that this will improve in the near future (Table 1). This is true even in large countries like Nigeria where, other than TETFUND, no significant domestic sources of R&D funding exist. In 2021 TETFUND committed a total of 7.5 billion naira—approximately 16 million USD (Egbetokun, 2022). In that year, Nigeria's GDP was nearly 441 billion USD. Available data from the World Development Indicators shows that Nigeria spent only 0.13% of GDP on R&D in 2007; sixteen years after, the government committed to a GERD of only 0.5% of GDP in 2023.[18]

**Table 2: Number of think tanks in Africa by region (2017)**

| Region | Number of regional think tanks | Number (%) included in the top regional think tanks |
|---|---|---|
| West | 242 | 33 (13.6) |
| Central | 44 | 3 (6.8) |
| East | 234 | 31 (13.3) |
| South | 130 | 21 (16.2) |
| North | 91 | 23 (25.3) |

One African think tank (the Mo Ibrahim Foundation) was listed as being in the UK and another one (the African Technology Policy Studies Network) was listed twice – once in Kenya and once in Tanzania.

Source: Author's estimation based on data from McGann (2018)

[17] https://www.timeshighereducation.com/student/best-universities/best-universities-africa

[18] https://leadership.ng/sti-federal-govt-to-implement-0-5-of-gdp-for-rd/

### *National and regional institutions and strategies*

National and regional policies and strategies for research help to address the challenges of a poorly structured research sector, misalignment between research programs and development objectives, and the heavy reliance on external funding (Touré, 2003). In particular, regional and national policy and strategies as well as central coordinating organs can play a key role in defining the research agenda and accrediting research output (NACETEM and GDN, 2020). In this regard, the countries of West and Central Africa made significant progress within the last decade and a half. The status of strategic planning for research in West and Central Africa reflects this progress.

West Africa in particular has a comparatively well-developed set of regional organizations (Table 3) and policies (Table 4) to frame research for development. For instance, the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) has postgraduate training programmes in 10 countries and has graduated over 250 students by 2018. Since 2018, the ECOWAS Research and Innovation Support Programme (PARI) has granted at least $350,000 for R&D. Partly as a consequence of the ECOWAS Policy on Science, Technology and Innovation (ECOPOST) which was adopted by most West African countries in 2012, national level policies for science, technology and innovation (STI) are more popular in West African than in Central Africa. At the time of writing, only one country in Central Africa has a national STI policy compared to nine out of the 15 West African countries (Table 5).

**Table 3: Selected regional research organizations in West and Central Africa**

| **Institution** | **Year Established** | **Highlights** | **Remarks** |
|---|---|---|---|
| *West Africa* | | | |
| ECOWAS Research and Innovation Support Programme (PARI) | 2018 | Awards an annual grant to researchers | A single PARI grant for US$ 100 000 and two grants of US$ 150 000 each were awarded in 2018 and 2019, respectively. The ECOWAS Commission increased the value of each grant to US$ 200 000 in 2020. |
| African Scientific and Research Innovation Council | 2016 | Technical advisory body to support implementation of STISA-2024 | |
| West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) | 2012 | Established MSc and PhD programmes in climate science at selected universities in ten West African countries | 258 graduates by 2018 |
| ECOWAS Centre for Renewable Energy and Energy Efficiency | 2010 | In 2018, launched a project aimed at Improving the Governance of the Renewable Energy and Energy Efficiency Sector in West Africa, in co-operation with Deutsche Gesellschaft für Internationale Zusammenarbeit and with the financial support of the European Union and Germany. | |

Source: UNESCO, 2021

**Table 4: Selected regional research policies and programmes in West Africa**

| Policy | Year | Highlights | Remarks |
|---|---|---|---|
| *West Africa* | | | |
| ECOWAS Policy on Science, Technology and Innovation (ECOPOST) and Action Plan | 2012-2024 | Recommends establishment of the ECOWAS Academy of Sciences and subsequently, the ECOWAS Journal of Science, Technology and Innovation | Concept notes have since been developed and a technical meeting bringing together national academies of sciences was held in 2020 to finalize plans |
| ECOWAS Strategy on Space Sciences and Geomatics | 2012 | | |

Source: UNESCO, 2021

**Table 5: Country-level STI policy in West and Central Africa**

| Country | STI Policy | Related policies/funds | Responsible Ministry |
|---|---|---|---|
| *West Africa* | | | |
| Benin | Development Plan for Higher Education and Research (2013–2017) | National Fund for Scientific Research and Technological Innovation | Ministry of Higher Education and Scientific Research |
| Burkina Faso | National Policy for Scientific and Technological Research (2013–2025) | National Innovation Strategy (2016–2025)<br><br>National Fund for Research and Innovation for Development (FONRID, 2011) | Ministry of Higher Education, Scientific Research and Innovation |
| Cabo Verde | - | Strategic Plan for Sustainable Development (2017–2021) | Ministry of Education (via Office of Science, Technology and Innovation) |
| Cote D'Ivoire | - | Strategic Support Programme for Scientific Research (PASRES) | Ministry of Higher Education and Scientific Research |
| Ghana | National Science, Technology and Innovation Policy (2017–2022) | Coordinated Programme of Economic and Social Development Policies (2017–2024) | Ministry of Environment, Science, Technology and Innovation |
| Guinea | Action plan for Higher Education and Scientific Research (2016–2020) | National Plan for Economic and Social Development (PNDES) | Ministry of Higher Education and Scientific Research |
| Guinea-Bissau | - | Terra Ranka (Fresh Start) Strategy | Ministry of Higher Education and |

| | | | |
|---|---|---|---|
| | | (2015–2020)<br><br>Sectoral Programme for Education (2017–2025) | Scientific Research<br><br>Ministry of Education (shared responsibility) |
| Liberia | - | Education Sector Plan, 2017–2021<br>l Innovation Fund for Entrepreneurship (LIFE, operational since 2015)<br>l National ICT Policy (2018–2023) | Ministry of Education |
| Mali | National Policy for Science, Technology and Innovation (PNSTI) [2017–2025] | Action Plan for PNSTI (2017)<br><br>Competitive Fund for Research and Technological Innovation (2011)<br><br>Strategic Framework for Economic and Sustainable Development (2016–2018) | Ministry of Higher Education and Scientific Research |
| Niger | Niger Science, Technology and Innovation Policy (POSTINI), adopted in 2018 | Support Fund for Scientific Research and Technological Innovation (FARSIT)<br><br>Intellectual Property Support Fund (FAPI) | Ministry of Higher Education, Research and Innovation |
| Nigeria | Science, Technology and Innovation Policy (2012–2020; 2022-2028) | Economic Recovery and Growth Plan (2022-2027)<br><br>Tertiary Education Trust Fund | Ministry of Science, Technology and Innovation |
| Senegal | Development Plan for Higher Education and Research (PDESR) [2013–2017] | Fund for Scientific and Technological research (FIRST)<br><br>Fund for Agricultural and Food Research<br><br>Fund for Scientific and Technical Publications | Ministry of Higher Education, Research and Innovation |
| Sierra Leone | - | Medium-Term National Development Plan (2019–2023) | Ministry of Education, Science and Technology |
| The Gambia | National Science, | National Development | Ministry of Higher |

| | | | |
|---|---|---|---|
| | Technology and Innovation Policy (2015–2024) | Plan (2018–2021) | Education, Research, Science and Technology |
| Togo | - | National Development Plan (2018–2022) | Ministry of Higher Education and Research |
| *Central Africa* | | | |
| Cameroon | - | National Development Strategy 2020–2030<br><br>Digital Cameroon 2020 Strategic Plan (2017), implemented by Ministry of Posts and Telecommunications<br><br>National Strategic Plan for Information and Communication Technologies 2020 (2016) | Ministry of Scientific Research and Innovation |
| Central African Republic | - | National Peacebuilding and Recovery Plan 2017–2021 | Ministry of Scientific Research and Technological Innovation |
| Chad | - | Vision 2030 (2017), implemented through three successive National Development Programmes<br><br>National Development Plan 2017–2021<br><br>Energy Policy (2019) | Ministry of Higher Education and Scientific Research |
| Congo | National Policy of Science and Technology | National Development Plan 2018–2022<br><br>Education Sector Strategy 2015–2025<br><br>National Development Programme 2018–2028 (with sectoral research policy) | Ministry of Scientific Research and Technological Innovation<br><br>Science and Technology Commission |
| Equatorial Guinea | - | | Ministry of Education, Higher Education and Sports |
| Gabon | - | States General of Education, Research and aligning Training with Jobs (2010)<br><br>Emerging Gabon: Strategic Plan to 2025 (2012) | Ministry of Higher Education, Scientific Research and Technology Transfer |

Source: UNESCO, 2021

### *Research personnel and production*

Reliable data on research personnel is sparse in West and Central Africa but the available data suggests that researchers are in short supply, especially in engineering and agriculture (Figure 2). Recent data on the number of researchers per million people is available for only three countries (the Gambia, Mali and Togo) in West Africa, all of which have just around 50 full-time equivalent researchers per million inhabitants (Table 1). Available data from 2010 onwards show a generally low number of researchers across the West African countries, with the exception of Senegal. In Central Africa, data on the number of researchers is available only for Chad and it shows that the country has just about 60 full-time equivalent researchers in every one million people (Table 1).

Data from UNESCO (2021) shows that research production in West and Central Africa has witnessed a modest increase but it is concentrated in a few countries and on a few themes. However, a massive inequality exists among the countries (Table 6). Nigeria and Ghana alone accounted for 11,000 (78.6%) of the 14,473 publications attributed to West Africa in Scopus in 2018 and 11,796 (76.1%) of 15,503 in 2019. In Central Africa, Cameroon alone accounted for about 1,600 (70%) of around 2,200 research publications in 2018 and similarly in 2019. An overwhelming majority of the research in all the countries of West and Central Africa is in the domain of health sciences. Other fields such agriculture, fisheries and forestry; environmental sciences; animal and plant biology; and ICTs, mathematics and statistics also feature prominently in the research portfolio of many countries.

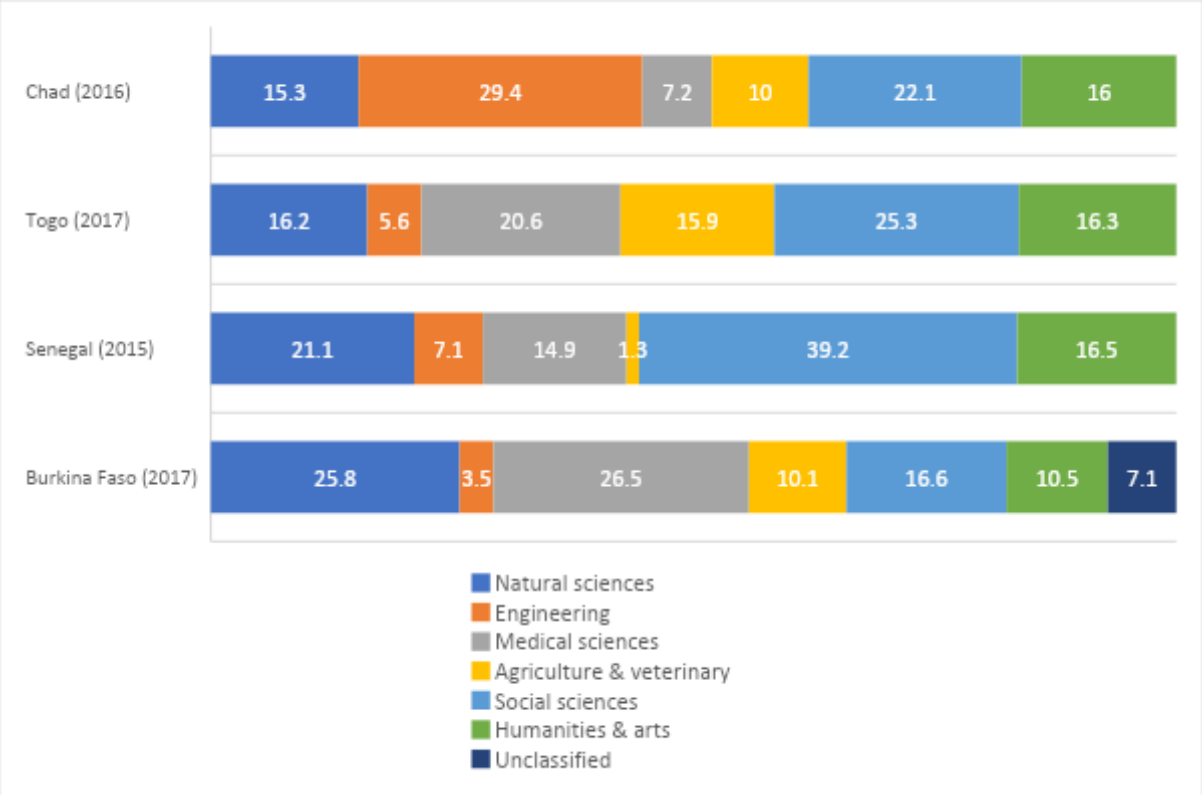


**Figure 2: Researchers by field of science (HC) in selected countries of West and Central Africa, latest available year (%)**

Source: Author's illustration of data from UNESCO World Science Report, 2020

**Table 6: Number of scientific publications by country**

| Country | 2018 | 2019 | 2020 | 2021 | 2022 | Total | % change, 2018-22 |
|---|---|---|---|---|---|---|---|
| Nigeria | 10251 | 12435 | 14625 | 16952 | 17128 | 71391 | 67 |
| Ghana | 3134 | 3689 | 4426 | 5323 | 6596 | 23168 | 110 |
| Cameroon | 1782 | 1885 | 2256 | 2627 | 2855 | 11405 | 60 |
| Senegal | 895 | 918 | 1062 | 1076 | 1111 | 5062 | 24 |
| Burkina Faso | 663 | 674 | 705 | 857 | 950 | 3849 | 43 |
| Côte D'ivoire | 603 | 611 | 676 | 846 | 770 | 3506 | 28 |
| Benin | 564 | 631 | 684 | 907 | 887 | 3673 | 57 |
| Congo | 496 | 468 | 443 | 486 | 521 | 2414 | 5 |
| Mali | 313 | 353 | 358 | 401 | 450 | 1875 | 44 |
| Togo | 224 | 225 | 239 | 281 | 332 | 1301 | 48 |
| Niger | 212 | 209 | 224 | 241 | 255 | 1141 | 20 |
| Democratic Republic Of Congo | 192 | 286 | 504 | 658 | 731 | 2371 | 281 |
| Sierra Leone | 172 | 184 | 224 | 297 | 343 | 1220 | 99 |
| Gambia | 161 | 206 | 257 | 315 | 320 | 1259 | 99 |
| Liberia | 106 | 127 | 88 | 148 | 302 | 771 | 185 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Guinea | 101 | 132 | 155 | 188 | 171 | 747 | 69 |
| Central African Republic | 71 | 59 | 80 | 77 | 85 | 372 | 20 |
| Mauritania | 68 | 81 | 88 | 114 | 97 | 448 | 43 |
| Guinea Bissau | 60 | 60 | 64 | 73 | 62 | 319 | 3 |
| Chad | 58 | 69 | 68 | 106 | 109 | 410 | 88 |
| Cape Verde | 38 | 56 | 73 | 85 | 85 | 337 | 124 |
| Equatorial Guinea | 22 | 20 | 15 | 29 | 21 | 107 | -5 |
| Sao Tome and Principe | 7 | 10 | 12 | 13 | 16 | 58 | 129 |
| Total | 20193 | 23388 | 27326 | 32100 | 34197 | 137204 | |

Source: Scimago, data collected on May 10, 2023

## B. Challenges in the R4D Environment

The characterization above signposts some key challenges facing research in West and Central Africa, notably insufficient funding, low individual and institutional capacity, and financial instability. These challenges are similar to those identified in other parts of sub-Saharan Africa by Ezeh and Lu (2019). These challenges are associated with a number of other notable factors, including:

i. Low investment in research and development at the national and regional levels. West and Central Africa is one of the regions in the world with the lowest investment in research and development. This lack of investment has led to a shortage of resources for research, which has hampered the development of the research sector.

ii. Unequal distribution of research production. Research production in West and Central Africa is highly unequal, with a few countries producing the majority of research. This inequality is due to a number of factors, including differences in the level of economic development, the availability of resources, and the quality of research institutions.

iii. Dominance of a few countries in terms of quality research outputs. A few countries in West and Central Africa dominate in terms of quality research outputs. This dominance is due mainly to a wide variation among the countries in terms of the availability of resources, the quality of research institutions, and the level of international collaboration.

iv. Poor and inconsistent planning. Many national and regional strategies and policies fail to adequately establish a link between research and development. This problem is

exacerbated by political instability that often truncates existing plans. Despite the strategic plans, evaluations have shown that they have not been integrated into other sectoral policies. This integration is essential for research to play its full role in national economic life (UNESCO, 2021).

These challenges have a number of negative consequences. First, the lack of investment in research and development has led to a lack of research-led innovation in the region. This has hampered the development of new technologies and solutions to the problems facing the region. For instance, only a total of 43 IP5[19] patents were granted to inventors from Central Africa in 2019. Cameroon alone accounted for 32 (70%) of these; the rest were spread between Gabon and Congo. Across all West African countries, only 590 IP5 patents were granted between 2015 and 2019, with 37% going to Nigeria. Moreover, low funding and weak institutions coupled with the dominance of a few countries in terms of quality research outputs has led to a brain drain in the region. This has hampered the development of the research sector and the retention of talented researchers.

### C. Trends in the R4D Environment

From 2018 to 2023, several trends are visible in the overall R4D landscape in West and Central Africa. These include:

i. an increase in the number of national and regional R4D policies plans, projects and programs especially in West Africa;
ii. research and training are being underfunded, which is leading to the deterioration of capacity and facilities;
iii. a continued reliance on external sources of research funding;
iv. a heavy focus on health research with rising capacity in other fields; and
v. a high and persistent inequality in research production among countries

These trends are likely to continue in the medium to long term, considering the prevailing political and economic circumstances in the region.

[19] IP5 refers to the US Patent and Trademark Office, European Patent Office, Japanese Patent Office, Korean Intellectual Property Office and State Intellectual Property Office of the People's Republic of China.