

The Transformation of Africa's Knowledge: Thinking African Futures in Response to Global Challenges

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Man's condition, his projects and collaboration with others on tasks that strengthen man's totality, are new issues which require genuine inspiration.

Frantz Fanon, *The Wretched of the Earth*, 1963 [1961]

Across early capitalism, the term "Black" referred only to the condition imposed on peoples of African origin (different forms of depredation, dispossession of all power of self-determination, and, most of all, dispossession of the future and of time, the two matrices of the possible). Now, for the first time in human history, the term "Black" has been generalized. This new fungibility, this solubility, institutionalized as a new norm of existence and expanded to the entire planet, is what I call the Becoming Black of the world.

Achille Mbembe, *Critique of Black Reason*, 2017 [2015].

Africa and the entanglement of continental and planetary futures

This text is a plea for African responses to global challenges. Its central argument is that the challenge of the 21st century is Africa's coming knowledge,¹ an expression we use to indicate that Africa and the planet are two

¹ Adapted from Achille Mbembe's expression (2017 [2015]: 5–6).

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“entangled” fronts whose challenges and responses are interlinked, and that the creation of knowledge which simultaneously addresses sustainable well-being and African and global environmental governance therefore stands out as the priority agenda of a long-awaited, but never realised, African scientific and technological transition.² It is because no such transition has ever taken place that Africa occupies its current subaltern position on the world stage. Unless this transition can be successfully realised, Africa risks not only digital dependence, over and above those experienced in the first three industrial revolutions, but also, and especially, the inability to govern generations that would accept neither poorly patched-together public policy nor the deepening of global inequalities. Not to mention the very survival of the planet, which will be more excruciating still if Africa follows the development trajectories of the West and Asia.

We are, then, very likely at a critical juncture that requires an explicit change of plan, far beyond reforming the research sector, in so far as “we cannot separate science from broader social forces and make the development of scientific knowledge a focus of interest only to science, for the fundamental issue is social change” (Ake, 1980, p. 5).

In proposing that there is no African presence, to the self or to the world, without epistemic re-framing, we are saying nothing that is not based on already classic observations³ What we add is that Africa’s coming knowledge could be, perhaps through a trick of History, the (best) response to the Becoming Black of the world, which Mbembe has set out in detail, or, more broadly, to the Capitalocene. Research alone can obviously not achieve all the rethinking and redoing this concept calls for; however, we can say with Amin, Atta-Mills, Bujra and Mkandawire (1978, p. 5) that “we believe [...] that intellectual efforts interact with social forces, and can at crucial times influence them.” The role of research does not end with understanding the existing transformations of our world, or with innovation. To make these transitions meaningful, and to support them, societies must put in place and train a new generation of world citizens.

If, in this text, we treat Africa as a comprehensible, analysable whole on which the analysis of “its” future can be projected—despite the term referring to such different actors, institutions, and realities—it is that, beyond the geographical “continent” form, we locate an important aspiration: a feeling of belonging (I am African) and a designation (you are African). The question then becomes: How do we build a “common” future on sentiment? And at what scale are these sentiments most effective for collective action? These sentiments, like Pan-Africanism, are real, powerful, and respectable. We also adopt, here, Valentin-Yves Mudimbe’s reflection on the epithet “African” as attached to the university. This quality, according to this philosopher, does not hinge on a university’s geographical location (being established in a country on the continent), nor on its composition (a university run by Africans) nor even on the teaching provided there (African subjects). These are “secondary considerations”; the university is African “when it contributes as much as possible to understanding and resolving the contradictions at play in African societies, and fulfils its appropriate role in creating new social forms, in an Africa that confronts the challenge of its development, and of its adaptation to the modern world. If it does not do so, it is certainly not African, even if it is composed, from top to bottom, of Africans.” (Mudimbe, 1982, p. 101).

This point being made, our proposal to align analysis of the African situation and its futures with those of the planet arises for four closely related reasons. The first is that degradation has been and remains the common order in Africa and on the planet: both have been

2 The Lagos Plan of Action, 1980, initiated by African Heads of State and Government, considered it “vital and extremely urgent, at this decisive turning point in history, that African planners and leaders prove that they have the political will and the courage required to modify, in depth and in the long term, the current situation concerning the use of science and technology as a basis for socioeconomic development” (cf. Yachir 1982: 34). This plan was supplanted by the World Bank’s “Accelerated Development in sub-Saharan Africa Report,” or “Berg Report,” which forced African economies into SAPs. Samir Amin (1982: 30) saw in it a “proposal for a neocolonial strategy of extraversion, based on prioritising the adjustment of the continent to the constraints of ‘global development’, that is to say, that of the North.” In a general way, social science in Africa, at least as promoted by CODESRIA, had as its main concern the formulation of a development model that would be in line with African realities. Today, the vision of African leaders put forward in the African Union’s Agenda 2063 concerns the African Continental Free Trade Area, a visa-free zone area, an African Digital Single Market, and a single African air transport market; these initiatives “aim to transform Africa into a future global power” (Agenda 2063). The Agenda’s ambition: a prosperous Africa based on inclusive growth and sustainable development.

3 Alioune Diop, Valentin Mudimbe, Fanon, Claude Ake and critical postcolonial and decolonial theory. Codesria’s *Africa Development*, in this respect, constitutes an exceptional archive.

taken hostage for centuries by the global capitalist economy. If indeed the planet has been overexploited, and natural ecosystems everywhere devastated, it is particularly in this space called Africa that exploitation (of men, women and children, natural resources, raw materials, cultural creations, illicit financial flows, personal data) has been and remains among the most violent, least subject to law, most excessive and most continuous. Secondly, starting from the fact that extractivism is ultraliberalism's permanent character, and the condition of its reproduction, we can propose that the logics underlying the push against Africa's political, economic and cultural sovereignty, and that against a new civilisational option based on ecology, are fundamentally linked.

That is why, thirdly, the struggle for Africa's total sovereignty must be as radical as the struggle for the advent of an ecological society. Finally, it is in winning this double wager that African responses will trigger the exit from the Becoming Black of the world, and therefore of the Capitalocene,⁴ contributing simultaneously to returning the Human and Nature to the heart of social projects.

Such is the scope of Africa's coming knowledge. It permits us to hold humanity as an ethical horizon, to once again restore—after centuries of epistemic violence—the confidence of an entire generation in the continent's capacity to propose answers for the world, to think locally and globally, to avoid isolating internal problems from global problems, and, in doing so, reinvent the training of 21st century researcher-citizens, reorient research priorities, and adequately problematise issues, that is to say, in a truly interdisciplinary and critical manner, armed with the appropriate concepts. This perspective also invites an interrogation of the politics of knowledge and scientific cooperation, to be implemented by drawing on prior experiences to reveal the conditions of possibility and the obstacles, study the interactions between science, power, and development in the African context, see its differential implications for diverse social groups (women, youth, intellectuals, farmers), and identify allies and adversaries.⁵ The coming knowledge also includes the challenge of creating innovative knowledge for the world that puts the quest for truth on the same level as the quest for care for the living, human and non-human—one of the major challenges of our century.

The freedom and will to think about the Africa-world,⁶ self-confidence, the search for truth, and care for the living: this is the agenda.

When we know the vertiginous contradictions in which the continent moves, the question of the feasibility of such an intellectual and political project immediately arises, for, if the assets are immense, so is the misfortune.

In a general way, African societies remain still “trapped in a permanent crisis of authoritarianism, the failure of states, and economic collapse” (Heilbrunn, 2009, p. 255), which undermines human security, peace and development, thus exacerbating the vulnerability of millions of individuals, and driving the exodus of thousands of young people. Enormous groups of people live in endemic poverty,⁷ precariousness, marginality, and oppression, including, in particular, informal-sector workers, rural people, small producers, and women and children. Young people, without training or diplomas, need decent employment, a role in society, access to basic social services, to energy and infrastructures, and an active role in determining the future of their countries.

These complex domestic and regional challenges are further entangled with an international situation characterised by persistent inequalities, democratic fatigue, and economic and financial uncertainty, now exacerbated by pandemic crises, fear of (bio)terrorism, and profound transformation of the environment and its resources due to climate change.

4 A more pointed qualification of the Anthropocene to designate the current geological era of capitalism.

5 “Although these ideologies and practices are instrumental in perpetuating underdevelopment, they serve powerful interests that will not only put up great resistance to any attempt at change toward other ideologies, but will also prevent the development of new theories, because of the profound global influence they exert on the production of ideas” (Ake, 1980, p. 9).

6 Exemplary in this respect, the work of Souleymane Bachir Diagne (2015, 2017) explicitly adopts the ethical horizon of the world, of humanity, of a universal – not imperialist here, but the fruit of a respectful dialogue between several points of view. Nor are the titles of the first Ateliers de la Pensée (Thought Workshop) in Dakar and Saint-Louis “Écrire l'Afrique-monde” (Writing the Africa-World) or of the 2017 book by Felwine Sarr, *Habiter le monde* [Living (in) the World], forthcoming in English.

7 The continent is home to 390 million people living below the poverty line.

These unprecedented and complex international challenges unfold under the regime of urgency, uncertainty and catastrophe, leading to a kind of fear of the future, and the disintegration of confidence in oneself and others. Africa, indeed together with the rest of the world, is witnessing an alarming scene of ecological crisis, for which the Anthropocene is known:⁸ extensive human interference in natural ecosystems, the depletion and erosion of soils, unprecedented levels of pollution, the disruption of the water cycle, deforestation, ocean acidification, and never before seen demographic pressure on land systems (Magny, 2021, p. 4). According to projections, Africa, due to its high exposure to all these challenges, and its low capacity for adaptation, will be among the continents most affected by and most vulnerable to climate change (IPCC, 2014 ; IPBES, 2019).

However, the accumulation of heterogeneous challenges, from artificial intelligence to the consolidation of the deliberative welfare state via climate change, economic growth, human security, rural development, urbanisation, mobility, peace-building, human rights, and gender equality, present only one common denominator: the continent remains practically absent from the work of theorising, projection, and the anticipatory analysis of these questions, even if these challenges affect Africa more than any other place in the world. For example, climate change is slated to negatively affect African countries' economic development; average climate-induced economic losses range from 10% to 15% of GDP growth per capita, with the majority of African economies ill-prepared to adapt to new climatic conditions, particularly in West and Central Africa (Baarsch et al., 2019). And yet, publications by African scholars represent only 2% of all publications in this domain (McSweeney, 2015). The same can be said about global inequalities, artificial intelligence, transhumanism, data protection, etc. Africa is hesitant and uncertain in the consideration of its own future and, simultaneously, of existing and future global conditions.

At the origin of this absence from oneself and from the world is the crisis, beginning in the 1980s, of African higher education institutions, which gradually became unable to maintain and develop the standards of knowledge essential to the inclusion of African voices in global debates. The unfortunately well-known politics of Structural Adjustment (1980–2000) carried out by the World Bank and the IMF⁹ favoured downsizing and the dismantling of research institutions and public universities. Excellence in international research, including in African Studies, became firmly anchored in the Global North, confirming a “geopolitics of knowledge” (Mignolo, 2002) that views Africa as the source of empirical data to be extracted (the raw material), while pure research is carried out in the Global North.

And yet, the need to create emancipatory knowledge, and knowledge that protects both humans and Nature, in which pure and applied research would be mutually enhancing, has never been so stark. The contemporary African challenge is thus: to transform the concrete, the actual, through an approach that is attentive to global limits—by de-fetishizing and going beyond the factual. This work, of adequately representing the continent's realities and interests—essential work that must not be confused with the picking apart of statistics either of disaster or euphoria—remains, since Berlin in 1885, the inescapable task. The restoration of African intellectual initiatives is, in fact, embodied in the critique of the internal and globalised political economy, and also in the reestablishment of respect for care, for the sense of discernment, the critical spirit, and the spirit of freedom and innovation.

Consequently, starting from Africa, for Africa and the world, we must produce a restorative science, fundamental, “plural” and “participatory” (Coutellec, 2015), centred on and mobilised for sustainability. This 21st-century science must define its own action, not in terms of scientific disciplines, but in terms of peoples' crucial priorities and aspirations. This science will offer answers that can emancipate individuals, generate innovative, useful knowledges, enlarge the role of Africa in the global creation of protective knowledges, speed the advent of a low-carbon, blue, and circular economy based on accessible renewable energy, and inform policy, favouring effective and timely interventions.

8 Also referred to as the Capitalocene, Platantionocene, and Eurocene era, in Grove (2016).

9 The journal *Africa Development* has devoted numerous special issues to this question. See, for example, Vol. X, No. 1/2, 1985, *Crise et ajustement*.

From here, a new set of questions emerges:

- What forms of knowledge and responsibility from the continent are likely to address basic needs and respond to planetary challenges? What is the role of traditional knowledges in these transitions? What is the role of citizens?
- What do sustainability, development and accountability under global conditions mean in the context of Africa?
- How to develop a better understanding of the intersections of the local, the global, and the planetary?
- How do we rethink analytical frameworks and scientific methods that transcend linguistic, geographical, institutional and disciplinary boundaries, in order to practice the much-needed interdisciplinarity?
- How to ensure that South–North and South–South exchanges obey a logic of mutual contributions and benefits, rather than of substitution and subjugation?
- How can modes of action coming from the South inspire the rest of the world, particularly in the context of the crisis of modern science?

While these are extremely urgent questions, the political ambition to make African research a principal engine of these transitions has, so far, not been realised¹⁰ and Africa's status in global research is largely negative. Moreover, although this epistemic emergency is expressed and experienced daily, we have for several years been distracted by ever more enthusiastic and optimistic, but marginally materialised, visions of the future. The awakening of Africa promised in some of these visions rests on the hypothesis of an Africa that will “turn the page,” “emerge,” or “take off,” to become “the Asia of the 21st century,” the new “engine of the world economy,” and of what is to be “the African century” (UE, 2016). We thus expect an economic miracle that will change the continent's destiny, with, ultimately, considerable rewards for the rest of the world. “Emergence,” the new name of development ideology, is, at best, a self-fulfilling prophecy, at worst, a mystification which consists, like its prior incarnations, of the elaboration of inadequate theories and ill-suited strategies.¹¹ This promised future is no more than a copy of Europe's past (or Asia's present), since it concerns the same model of development— more precisely, the “developmental fallacy,” in the words of Enrique Dussel (1992, p. 31)—based on the thermo-industrial model of extraction and depletion of humanity the planet. This proposed Africa, or rather, this mimicry of Europe or Asia, would be a vulgar accelerator of Capitalocene, and not worth one hour's consideration, for, to reprise the famous conclusion of Fanon's *The Wretched of the Earth*: “Humanity expects other things from us than this grotesque and broadly obscene imitation.”

This future that we are promised is characterised by the blatant absence of culture (for compulsive consumerism and the industry of distraction are not culture); it is entirely contained in the welfare state of political and socio economic rights—welcome, certainly, but for the fact that it lacks emancipation, a moral climate of active solidarity, and is heedless of the planet. We must therefore reject it, and, in its stead, write a trajectory of adequate and coherent development that neglects no dimension of the human.

This is precisely what we await from the continent, and this is why African research must be a priority for Africa and the entire World.

African research, its responsibility and purpose

In fact, Africa has made and continues to make new proposals, to set new options on the table. These exist; they have not been heard; there has been no will to listen to them, including in Africa. But these options, which dare to think of Africa's futures, are demanding, total, radical. Alternative trajectories had already been outlined in the critical

¹⁰ All member countries of the African Union have committed to devoting 1% of their respective GDP to research and development, but spend, on average, only 0.45% (UNESCO 2021). African nations, grappling with many competing needs, are not investing in research, although in the current era, efforts to impose innovation as the engine of economic development in our societies, and investment in science as strategic, appear in many countries to be redoubled. Thus, South Korea has become the world leader, by devoting 4.3% of its GDP to R&D, with impressive results in terms of development.

¹¹ See the dozens of strategic plans trending across the continent.

years of the struggle for independence by Frantz Fanon, Cheikh Anta Diop, Kwame Nkrumah, Amílcar Cabral, etc. The conclusion of Fanon's *The Wretched of the Earth* constitutes an unsurpassed roadmap for the humanist trajectory that must be Africa's.

Indeed, Fanon outlines what is expected from the continent ("Let us reexamine the question of man" (Fanon, 1963 [1961], p. 237); what must be resisted (the seduction of material achievements), the role of the creation of knowledge in this project ("But if we want humanity to take one step forward ... then we must innovate, we must be pioneers," p. 236) and even the frame of mind we must take up ("The new day which is dawning must find us determined, enlightened and resolute," p. 235). Further, although dedicated to the emancipation of the black man and woman, his thinking leaves a large place for the Other; it is beyond resentment and hatred: "For Europe, for ourselves and for humanity, comrades, we must make a new start, develop a new way of thinking, and endeavor to create a new man" (p. 239), Fanon concluded.

We must add this responsibility and ethic to the development agenda, as Fanon calls us to do, for not all successes have the same value, and the profound transformations for which we call are, in our view, not only social, economic, and ecological, but also moral, humanist, and convivial. The future cannot be founded on a model that stops "the progress of other men ... and enslave[s] them for its own purposes and glory" (p. 235). This future must permit, here, the actualisation of social, economic, and political rights, without elsewhere mystifying, humiliating, massacring, and depleting. A future without hegemony, without a will to power, without "fervor, cynicism, and violence." On the contrary, it is a question, to once again follow the conclusion offered by Fanon, of embracing things and beings in "humility and modesty, but also [in] solicitude and tenderness."

African research must be a priority for Africa and for the world, because the planet's survival is partly at stake in Africa, and at least part of the solution will have to be African.¹² Today, the urgency of the situation is highlighted in numerous international reports, and ever more pervasive in our activities, but the strategy for combatting global warming and the loss of biodiversity is not yet apparent, and in no case does it reverse the serious trends that have been estimated. Recent international reports (GIEC ; IPBES ; World Atlas of Desertification ; GSDR Dasgupta, 2021) show an alarming and ever more rapid degradation of global ecosystems due to the combined effects of climate change, the overexploitation of renewable resources, and the destruction of natural habitats. Despite international commitments (COP 21 ; UNFCCC), we are unable to achieve the objectives that would reverse these significant trends, and allow us to sustainably exploit our environment. The progress achieved so far seems minimal, in view of the upheavals and environmental transformations we are currently experiencing. Approaches that allow for a balance between exploitation and conservation are decidedly lacking in political impetus. Despite policy pronouncements, biodiversity protection is still conservative. Marine preserves represent less than 8% of total ocean surface, and agroecology, which would permit sustainable agriculture over the long term, hovers at just 6%. The depletion of biodiversity and of our environment endangers our societies—whose survival rests on nature's contributions. Added to this are the increasingly glaring inequalities experienced by the different peoples of the world; these remain little or poorly measured by development indicators (Rapport sur le développement humain 2019).

In any scenario, the continent of Africa will be one of the most affected and most vulnerable; temperature projections for West Africa for the end of the 21st century, based on global climate simulations, range between 3°C and 6 °C, depending on various emission scenarios. Certain regions are expected to face unprecedented climatic conditions around 2040, leaving entire regions uninhabitable. Climate change will also have an impact on marine resources. It will thus considerably modify the distribution of marine species and affect the fishing industry. Projected scenarios estimate that tropical fish catches could decrease by up to 40%, to the benefit of higher latitude zones (Cheung et al, 2010; IPBES, 2019), jeopardising food security in the tropics. For 22 countries in West Africa, about 6.7 million people depend directly on fishing for nutritional needs and livelihoods (Belhabib et al., 2015).

¹² See "Global Sustainable Development Report," Africa Consultation Workshop Synthesis Report, Port Elizabeth, South Africa, 12 May 2018.

The continent's very survival is at stake, given the expected instability and conflicts that will emerge from these threats. If the continent finds answers that are pertinent and equal to the challenges and emergencies, these will be all the more replicable and appropriate for testing elsewhere. We can see here the intersection of African interests and those of the world.

In fact, Africa already inspires the world. The ecosystem approach to fisheries (EAF), designed to manage production systems in marine environments, was developed in South Africa for more than thirty years, making it possible to manage fisheries resources not only by reconciling the exploitation and protection of biodiversity, but by incorporating social and economic approaches important to the Benguela region (Augustyn et al., 2018). These approaches are innovative in more ways than one, in that they have initiated new research avenues and new ways of managing marine resources. A participatory approach was thus put forward in which all stakeholders collaboration was essential, all points of view represented, and particular attention was paid to ensuring that no group or individual could dominate the process. A standardised scientific and collaborative approach provided a platform for disseminating views, broadening perspectives, and improving understanding of the issues. This approach enabled comparison and reporting of scientific results and their implications for management at any level. NGOs played an important role, helping to implement the EAF and environmental initiatives. Efforts undertaken to develop the research and implement the EAF in management contexts enabled the sustainable management of marine resources, as well as an exploration of the importance of establishing marine preserves to feed ocean birds and predators, all the while avoiding dietary changes and invasion by other species—notably by jellyfish, which are disastrous to fishing communities (Cury et al., 2011; Travis et al., 2014). Such approaches have also made it possible to demonstrate that protected marine areas can not only decrease biodiversity loss, but can attenuate the effects of climate change, thus opening up new perspectives for research and in management (Roberts et al., 2017). This marine example shows that a project launched in South Africa can connect numerous modes of marine resource management often unknown in Europe and at the international level.

The need for inclusive knowledge that can integrate other forms of knowing and fashion new traditions, in which researchers are part of a larger network, is more and more urgent. Today, epistemic diversity and a rapprochement between the knowledges of scientific researchers and other social actors seems crucial; particularly when such themes as sensitive as poverty, food security, the use of renewable resources, migrations, conservations, living, care, or inequalities, require analyses based on local realities. This is why work on the pluriverse,¹³ the rehabilitation of endogenous ontologies and citizen science¹⁴ matter in discussions of global futures.

This implies an ambitious epistemological position, in which a universalist proposition is the more wellfounded when anchored in local issues and local epistemologies. This objective intersects in a very interesting way with current debates about the decolonisation of knowledges and critical theory of the South:

Assuming an epistemology of point of view therefore requires strong reflexivity and also an ethical responsibility. [...] The epistemology of point of view grants no epistemic privilege to the dominated. It nonetheless defends the idea that science cannot be conducted without their points of view and experiences. Their presence among scientists is not simply a cosmetic requirement for diversity, but a fundamental epistemological problem in all the scientific disciplines (Lepinard & Mazouz, 2021, pp. 50–51).

13 Our interest in Latin American currents of critical thought (particularly in the streams termed “modern/colonial” or “decolonial” studies) is owed to the richness of these Latin American researchers’ conceptual innovation for the project of a true universality. These authors gamble on an authentic universality, because, as Samir Amin points out (El Eurocentrismo. Crítica de una ideología, México, Siglo XXI, 1989, p. 109, quoted in Hurtado Lopez [2013: 36]): “the dominant modern culture claims to be founded on a humanist universalism. In truth, in its Eurocentric version, it is against [this very possibility]. For Eurocentrism implies the destruction of peoples and civilisations that resist its expansionist model.” It is therefore a question of “achieving a true, de facto, concrete and pluriversal universalism” (Hurtado Lopez 2017: 14).

14 See Kershaw (2005).

It will therefore be a matter of giving voice to peasants, women, healers, workers in the informal sector, students, engaging in dialogue that respects their points of view, enabling them to participate themselves in the processes of changes necessary to improve their living conditions. It will be necessary to ensure more broadly that the new policies of knowledge are associated with a policy of deliberating with citizens, whose responsibility to understand and act must be fully restored in the particularly dangerous context of questioning scientific truths.

While scientific debates elsewhere often fail to include the diverse set of perspectives that could be gleaned from endogenous knowledge, Africa has the potential to become an exceptional laboratory for finding new ways of working more effectively, if we are to have any chance of solving environmental crises.

African languages, until now devalued and denigrated, judged incapable of exerting a powerful theoretical and conceptual bearing, reveal themselves as a hermeneutic resource that can give new directions to scientific investigations. Because languages naturalise certain ways of thinking, turning to African languages could enable us to get beyond the orientations encouraged by the Eurocentric canon and identify new questions (Abadie, 2018). In *L'odeur du père* (The Scent of the Father), Valentin-Yves Mudimbe (1982, p. 47) wrote that a “change in the linguistic instrument of knowledge and of scientific production would surely provoke an epistemological rupture, and would open the path toward a new adventure for Africa,” in the same way that “those who promote Greek thought by transplanting into their language, technique, methods and usages knowledge received from Egypt have triggered a reorganisation of knowledge and of life, whose essential order is still current and in progress.”

Finally, African research must represent a priority for Africa and the whole world, because Africa has the good fortune, found almost nowhere else, of being peopled by tens of millions of creative young people born into digital technology. Africa, in all its diversity, is home to more than a billion people, and, for the group between 15 and 30 years of age alone, its population will double by 2050.¹⁵ Africa has the youngest and most dynamic middle class, with the potential to transform the continent's scientific, political, economic and social perspectives. This particularly concerns African women, who constitute the primary engines of sustainable growth, development, and peace (CE, 2021). The continent is also a fantastic reservoir of digital platform- and service-users: Today, 453 million Africans (out of 1.2 billion) are connected. This proportion will increase significantly with population growth. The continent and the world need this intelligence, this fantastic reservoir of ideas, their intellectual and creative investment. It is they who must immediately be prepared to reflect, innovate, and experiment with sustainable solutions. The challenge here is to design lessons that can set collective intelligence in motion, to ground teaching in problem-solving by involving several disciplines, and cultivate a taste for learning and invention. From this perspective, not only must higher education be democratised, but our research institutions must be completely reconfigured, in order to comprehend the issues' complexity and the scale of the necessary transformations; find solutions for contradictory situations; and respond to rapid changes, intervening at multiple levels.

Lest we be accused of utopianism, we must now confront the difficult question of the reversal of the conditions of impossibility into conditions of possibility.

Operationalising the African scientific transition

Here, we sketch out the practical proposals that appear to us to constitute the conditions for success. The objective of the continent's coming knowledge could be contained in the following formulation: for the African scientific transition, a structural and lasting investment in the reconstruction of the imaginary and in research institutions, for a science of sustainability.

Structural investment transverses these three domains, for almost everything depends on political and financial constraints, even as we are in a context of often extreme scarcity.

¹⁵ <https://www.one.org/fr/policy/le-siecle-de-lafrique/>.

The consistent and sustainable allocation of financial resources to public and university R&D is a priority in the initiation of transformation in African research. In this process, a decisive role of motivation, organisation and coordination devolves to African decision-makers, who will have to resolve not only to take hold of the future of their societies, but also assume their responsibility vis-a-vis the planet.

A new deal for research is essential to the promotion of African scientific and technological capacities. Sites of scientific power remain restricted to those who develop knowledge and use it to innovate, and to create wealth and employment. Unless more African research is done in Africa, by Africans, for Africans and the rest of the world, the full potential of this research will not be actualised, and scientific expertise will, at best, come from elsewhere: the impossibility of developing a Covid-19 vaccine on the continent is an apt illustration, given Africa's subordination, in order to benefit from vaccines, to choices made elsewhere.

Research today is international, and exchanges between researchers from all countries are needed in order to maintain a high level of scientific excellence. African scholars must have choice, to be able to develop excellent research produced in Africa. The objective of an African-European project like ARISE (www.aasciences.africa/call/arise), managed today by the African Academy of Sciences (AAS), is to support the emergence of this African scientific excellence among young researchers. This ambition will pave the way towards a more scientifically compelling Africa, capable of attracting and retaining the continent's best brains, who sometimes struggle to structure their research teams, recruit young talent, and develop innovative research trajectories. ARISE's objective is to foster an Africa better able to determine and implement its own research and development agenda.

Many more such initiatives are needed, as well as long-term funding, to build these scientific talents. It is equally critical to stem illicit financial flows (IFFs) and recover funds,¹⁶ while strengthening new partnerships with the private sector—in particular, the involvement of African entrepreneurs and foundations to support research—are avenues for this large-scale financing.

Rebuilding imaginaries: Without faith or desire, giving form to a new world is an impossible exercise. There will be no African response to these challenges without a regeneration and expansion of ideas and desires. Only a radical epistemological renewal—a paradigm shift—can lead to the development of thinking-off-the-beaten path, or thinking-that-does-not-harm-itself. A form of thinking that is also a re-conquest of power, which, in order to be realised, ventures a collective, Pan-African, international agency; in a word, the constitution of a community of thinkers, researchers and creators capable of articulating a continuum and coherence between ideas, desire, and the power to think about the future of African societies and of the world.

Sustainability versus Becoming Black

The African scientific transition necessitates a profound reconfiguration of the mode of functioning of basic and applied research, and of its ecosystem (higher education, publishing, dissemination, cooperation) within Africa in particular.

We must definitively leave behind isolated, closed disciplinary postures, moving toward mutual recognition of the objectives of cooperation that is beneficial to all actors. Yet research is still too fragmented and focused on certain disciplines; often extremely specialised, it remains insufficient with regard to the relationship between the results put forward and the problems to be solved. But we must work quickly, and collectively, to orient public policy. Research on climate, biodiversity, land degradation, inequalities, food security are exemplary in this respect, and demonstrate that reports drafted by a multidisciplinary scientific community lead to scientific consensus reports, such as those of the Intergovernmental Panel on Climate Change (IPCC) or on Biodiversity and Ecosystem Services (IPBES). New research frameworks can be developed with the goal of fostering dialogue between experts from different scientific disciplines, and creating collective knowledge. It is what groups of international experts (GIEC, HDR, IPBES) are

¹⁶ It is estimated that Africa loses more than fifty billion dollars yearly in IFFs.

already trying to do, by providing a multidisciplinary scientific consensus without which we cannot understand and act on our planet's future evolutions. In this context, the recent advent of sustainability science is the sign of a radical change in the construction of new knowledge systems. A defining characteristic of this approach is that research problems are rooted in the resolution of development goals, rather than in the dynamics of scientific disciplines alone. The goal is to promote interdisciplinary understandings, jointly constructed by researchers and social actors, in an effort to go beyond sometimes too-central disciplinary interests. This sustainability science is still marginal, but it is essential to better understanding the world's complexity, and to finding lasting solutions to the economic, social and environmental challenges our societies face. Nevertheless, there is an urgent need to reinforce these joint efforts, in order to reinforce understanding, more effectively integrating the full range of scientific expertise in close cooperation with policy-makers and civil society. To this end, the management of emergent diseases may be one of the most convincing illustrations of sustainability science's advantages. Responding to the Ebola crisis necessitated a coordinated effort oriented to a common goal—ecologists specialised in the dynamic of reservoir animal populations, sociologists and economists who research the vicious cycle of poverty, anthropologists specialised in the construction of representations of illness, and, of course, specialists in infectious diseases, and doctors cooperating with public health institutions in affected communities. Africa has a major card to play here, for it could position itself as the future champion of ecotechnology, ecotechnology, and of Green IT.

Training young researchers and ensuring their professional mobility

It has become imperative to train new generations of young researchers differently. The necessary revival of African research is narrowly tied to the practical need to make university and research careers more attractive. Here, the best and most brilliant move abroad; or, if they remain on the continent, they leave the world of science in order to make a living. Not only does this situation contribute to the increasing precariousness of the university job market; it also systematically undermines the execution of fundamental research that is essential to development.

To resolve this problem, the issue of expatriation must be resolved, and replaced by a standard of habitual mobility and return. Indeed, the reality of recent decades has been that the most qualified African students and early-career researchers seek advanced training or employment in the global North, which thus attracts the best talent.¹⁷ The loss of this precious “grey matter” and of researchers, to the benefit of countries of the North, represents not only a loss of talent, but also, in the medium and long term, a loss of economic drivers, of intellectual property, of mentors, and of structural models that could inspire future generations; as well as the loss of expertise that would otherwise be essential to successfully addressing African genetic, technological, and public health challenges (Marincola & Kariuki, 2020). Moreover, if we count on the return of “brains,” we only end up importing development models that are often ill-suited to the economic, political, and socio-ecological transformations that are needed locally.¹⁸ We must add to this the much greater “internal exodus” (Yachir, 1978), which results in “a research and training system inadequate to the requirements of autonomous social development.”

Today, sites of knowledge acquisition and training access appear planetary. With the Internet, distance education such as MOOCs and international student exchanges, it appears that opportunities once reserved for the wealthy are accessible to all: “Quality education is thus likely to reach the most remote regions, where, traditionally, educational

17 More broadly, it should be remembered that sub-Saharan Africa is still the world region from which the most intellectuals leave, in proportion to those who stay. Thirteen percent have left the continent for an OECD country (Organization for Economic Co-operation and Development), this rate being, proportionally, the highest in the world (Bocquier 2003). The skilled emigration rate remains exceptionally high for women from Africa. It stands at 18%, while those of Latin America and Asia only reach 10% and 4% respectively (OECD 2016).

18 Unsuitable development models are also due to our local political elite and the nature of their perspective of progress, which are influenced by international institutions.

infrastructure has been lacking” (Meyer 2017, p. 76). A more open, better-shared science is emerging; thus in 2018 AAS Open Research was launched to provide an immediate, high quality, peer-reviewed publication platform, enabling researchers and students associated to AAS to publish the results of their work.

Conclusion

If all societies are seeking sustainable development, not all societies face the same economic constraints. Profound transformations ongoing call for social, economic, and ecological transitions that only nations can define and take charge of. Faced with such complex issues and transformations of such large scale, scientific research can, on the one hand, assist in understanding and integrating the transformations we are currently undergoing, and, on the other, innovate and enable us to adapt to these changes. African research must take up all these challenges, while global issues lead us to invent new modes of development through scientific research, source of knowledge and of innovation.

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See p. 64-65.

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