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Knowledge and Development in Twenty-First Century Africa

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Abstract

Knowledge is the key to Africa's development, security, and good governanc Knowledge drives globalization, stock markets, changes in informatic technology, and strategies to tackle human immunodeficiency virus/acquire immunodeficiency syndrome (HIV/AIDS). This paper explores the glob structure of knowledge. It claims that Africa remains on the world's scientifi technological, economic, political, and military margins mainly because it is a n

consumer, rather than a producer, of usable knowledge. It examines the meanin of development in Africa. This paper discusses how African states could acqui a larger share in the benefits of global knowledge if they established a politic and legal atmosphere that permitted innovations in science and technolog flexible working conditions, and respect for fundamental freedoms. It furth discusses why African states would find it easier to build knowledge economi if they paid adequate attention to capacity building. This paper concludes th most of the knowledge that Africa needs for development appears to be embedde in the complex relations between globalization, security, and governanc Without these three factors, transmitting and applying new ideas in Africa wou be hard.

Keywords: Africa, Development, Globalization, Global Knowledge, Governance

Introduction

The West has long imagined Africa as the "heart of darkness" ever since Joseph Conrad depicted this bleak view in his 1899 novel of the same name. Conrad's character Kurtz's depiction of "the horror, the horror" has thus remained etched in the international psyche as of undeniably African origin. These images of "darkness" and "horror" are regularly reinforced by the media's fascination with representations of the regular "tribal" violence that occurs during civil wars and conflicts, all too commonly reported "out of Africa".[1] Yet relying upon these Western historical and contemporary "images of Africa", as sourced via popular media or classic literature, results in a minimal understanding of what contemporary Africa is.

What is Africa? The misconception that Africa is just "one place" and the lack of knowledge that it is a continent of 55 distinct nations, each with its own complex history and political intricacies, make this issue legitimate in the West. Another common misconception is that "Africa - as one place" is formed by the same social, political, and economic factors and produces the same social, political, and

financial results. All related regions, including southern Africa, East Africa, West Africa, North Africa, and the Horn of Africa, must also be acknowledged and included in any analysis of modern-day "Africa". While this mix of nation and region is challenging to some international relations theorists, it is necessary to acknowledge because of the multiple differences and interconnections that span the continent.[2]

Historians and social scientists have thoroughly examined and recorded Africa's "modern" history and politics.[3] Their writings have seamlessly integrated thematically into the discourse of African studies. African studies have seen several modifications and alterations from their beginnings in the "colonial project," with postcolonial, feminist, and postmodern ideas having a significant effect. In recent times, the "de colonial" perspective has advocated for a fresh round of "decolonization" in Africa, which includes the goal of freeing the continent and other postcolonial nations from the colonial "baggage" they acquired upon independence. This viewpoint also emphasizes how important it is that Africans take the lead in authoring their history.

Knowledge is essential for Africa to be secure, developed, and have excellent government. Knowledge is the engine of globalization, financial markets, information technology advancements, and HIV/AIDS response tactics. The goals of democratization, gender equality, environmental management, and sustainable development are all contingent upon rejecting outdated information and fostering a renaissance in knowledge. [Five] without some knowledge, Africa would not be able to develop progressive and successful governance systems, nor would it be able to grow economically or politically.

Thus, it makes sense that advancing "the development of the continent by promoting research in all fields, in particular in science and technology" is one of the African Union's goals. The Executive Council is also mandated by the Constitutive Act to coordinate and make decisions regarding "science and technology," as well as "education, culture, health, and human resource development." The Committee on Industry, Science and Technology, Energy, Natural Resources, and the Environment, as well as the Committee on Education, Culture, and Human Resources, are two Specialized Technical Committees that address knowledge and innovation formed under the Constitutive Act.

Furthermore, concepts, information, and innovation are the focus of the Commission's Science and Technology division. Thus, knowledge and its application in development activities are at the core of the Union's objectives.

Knowledge, progress, and worldwide impact are all correlated. To be able to affect global affairs, the African Union's member states would have to take part in managing the knowledge sources. Africa has a weak foundation in knowledge, particularly in science, technology, and innovation, which contributes to its extreme poverty and lack of impact on the world stage. When he made the following observation, Ali Mazrui effectively highlighted the importance of ideas: "The entire worldwide system of stratification has come to be based not on 'who owns what,' but on 'who knows what'."[6] Calestous Juma has made the following argument, urging African policymakers to consider science and technology more: "Most of the reference to Africa in international forums has focused on the continent's natural wealth." Natural resource endowment alone, however, is insufficient as a foundation for economic growth; expenditures in research and technology are also necessary."[7] Investing in research and technology means laying the groundwork for generating knowledge. For this paper, scientific know-how and formal and informal education are considered forms of knowledge. Numerous resources, such as books, journals, the internet, educational institutions, research institutes, internships, seminars, and conferences, can be used to get it.

The sword of knowledge has two edges: it may be used for building and destruction. This is because information may take many different forms. One can distinguish between knowledge that looks both forward and backward. This knowledge upholds and undermines moral and ethical principles, knowledge that promotes individualism and expertise that strongly emphasises communal identity and knowledge that supports and opposes gender equality. Information does not always exist for no reason. Globalization, security, and governance are the three factors supporting book arguments, and they are also closely linked to knowledge. Most of the knowledge Africa requires for development is entwined with the intricate relationships among globalization, security, and governance. These three things are necessary for spreading and implementing new ideas in Africa to be easy. Therefore, the African Union's potential to benefit from worldwide

knowledge flows hinges on its capacity to exploit the mutually beneficial link between globalization, security, and governance.

This paper is broken into four portions for the remainder of it. In the first, which examines the global structure of knowledge, it is argued that Africa is still on the periphery of science, technology, economics, politics, and the military because it is a net consumer rather than a provider of helpful information. The second looks at what development means in Africa. The third section discusses how African governments may gain more from pooling global knowledge if they create a political and legal environment that supports scientific and technological advancements, flexible work schedules, and preserving fundamental freedoms. The fourth explains why African governments would find it simpler to develop knowledge economies if they focused sufficiently on capacity building.

The Global Structure of Knowledge

Africa and the rest of the world community have equal opportunity to gain from global knowledge flows. Africa has abundant natural resources, but to convert them into riches that can be consumed, one must be able to participate in the right kinds of knowledge-intensive activities. Education, social learning, and the strategic alliances that the African Union (AU), African governments, and universities may form with foreign institutions are ways to achieve this. Through strategic collaborations, Africa may expand its knowledge in several fields, including science and technology, law, health, and policy studies.

Africa must pursue knowledge supporting democratic government, sustainable development, globalization, and peace-building. The AU and its members should take the lead in developing efforts to access relevant knowledge sources. The donor community would have to supply training facilities and cash to enable the AU and its members to carry out such projects. This is how "societies of shared knowledge," as UNESCO Director Koichiro Matsuura has put it, are created.[8]

Africa's contribution of new ideas and inventions is primarily determined by the global framework or structure of knowledge, which serves as a starting point for studying the role of expertise in Africa in a globalizing world. By promoting Western-generated forms of knowledge through journals, publications, conferences, and seminars, among other ways, the Western world controls the

worldwide structure of knowledge. For instance, the refereeing procedure in journals functions as a kind of police work, guaranteeing that only information presented in a manner consistent with American or Western norms is approved for publication. Journals from North America and Western Europe have different goals, even within the West. They prefer articles that utilize particular epistemological lenses and research methods to ensure that only certain forms of knowledge are produced.

Citations, seen as an indicator of a publication's impact, are another way the West and North America dominate knowledge. African academics primarily cite other Africans, even on African subjects, when reputable African sources exist, in contrast to North American and, to a lesser extent, Western European researchers who frequently cite sources from all over the world. Even Africans writing textbooks for other Africans mainly depend on methodological and epistemological viewpoints established by the West, failing to critically examine the moral and political implications of the paradigms they employ. *Power, Wealth and Global Order: An International Relations Textbook for Africa* is a superb example.[9] This is an excellent work From the perspective of conventional international relations ideas. However, it makes no effort to explore the perceptions of us/them, self/other and outside/inside in African traditions. Kwame Nkrumah has one item in its bibliography. Still, other notable African intellectuals like Frantz Fanon, Julius Nyerere, Leopold Senghor, and Sekou Toure, who helped to shape Africa's perspective of its interactions with the rest of the world, need to be listed. Africa has several drawbacks from its net information consumption instead of its production. First, information molded by non-African settings is applied by the AU and its members, which may or may not be relevant to African realities. The social and political process of producing knowledge reflects the institutional, historical, and cultural context in which its creators operate. Knowledge is created with social, scientific, or political goals in mind and the needs of academics and decision-makers. Researchers frequently use their cultural, ideological, or racial views to impact how they interpret data. Researchers stress specific facts depending on their audience and interests while ignoring others while distributing their results. Robert Cox's remarks regarding theory hold for knowledge as well. "Theory is always for someone and some purpose," said Cox.[10.] Every theory has a viewpoint. Position

in time and space—more significantly, social and political time and space—determines perspectives.

Furthermore, the language used by researchers to communicate their findings must be more value-neutral. The linguistic component takes on additional significance in sub-Saharan Africa due to the prevalence of borrowed languages such as English, French, and Portuguese used for idea transmission. Scholars can do rigorous study and handle all evidence reasonably. Still, they must produce knowledge with value since knowledge building is a social and political process.

Second, because Africa is not involved in deciding whether or not a claim to knowledge is valid, all knowledge is debatable and occasionally ephemeral. The fleeting nature of knowledge implies that, even if society accepts the conclusions of science now, it should maintain sight of the potential that these conclusions might be contested in the future. A recent example of successfully challenging accepted knowledge is the medical community's assertion that an overabundance of stomach acid causes peptic ulcers. Antacids were recommended for a long time, and they are still prescribed in many African nations. Still, Western Australian research conducted in the early 1980s discovered that Helicobacter pylori bacterium, not acidity, was the cause of stomach ulcers. The study found that helicobacter pylori was present in "100% of patients with duodenal ulcer and 80% of those with gastric ulcer."[11] This finding posed a serious threat to the pharmaceutical companies that produced antacids, and they first contested it, attempting to discredit the two medical researchers who had made the discovery—Barry J. Marshall and J. Robin Warren. Nevertheless, it is now widely acknowledged that helicobacter pylori "is the cause of most gastric and duodenal ulcers, with elimination of the organism leading to healing of the ulcers and a significant reduction in the incidence of recurrence."[12] (Marshall and Warren won the Nobel Prize in medicine due to their work). Knowledge contestations imply that Africa, as a net consumer, receives only that knowledge, which the knowledge brokers in the developed world consider socially and politically palatable.

As Andrea Useem contends, research is entangled in a global political economy that tends to marginalise Africa while being one of the few instruments—or weapons—available to professional intellectuals. Professors must raise money from one of the few funding sources in Africa: donor organisations like the US

Agency for International Development or the World Bank. These organisations frequently support the very orthodoxies that researchers aim to challenge. Public universities on the continent have pitiful research budgets. Additionally, intellectuals accuse their governments of favouring foreign concepts over Indigenous ones. However, Western ideas frequently come with strong incentives—the money to implement them.[13]

African researchers require top-notch facilities for study and experimentation to engage in the contestation of knowledge. Regrettably, few research institutes and centers in African states can rival North America's and the West's intellectual domination in various fields, including the humanities and social sciences, science, technology, and innovation. For example, the only organisation with a continental presence in security affairs is the Institute for Security Studies (ISS), established in South Africa. It has offices in numerous other African governments. Unfortunately, the ISS mainly employs the problem-solving technique, which takes for granted the preexisting paradigms created in the West due to the prevalence of policy-oriented analysts within its ranks.

A formula for addressing problems "takes the world as it finds it, with the prevailing social and power relationships and the institutions into which they are organized, as the given framework for action," according to Robert Cox.[14] This method can be helpful in some situations, particularly when it comes to "fixing limits or parameters to a problem area." However, it is inappropriate to utilize this method to criticize the dominance of the Western agenda for global security.[15] African scholars would need to integrate critical thinking and problem-solving skills to contribute meaningfully to global security discussions. "It does not take institutions and social and power relations for granted but calls them into question by concerning themselves with their origins and how and whether they might be in the process of changing," is how Cox characterizes a critical approach.[16]

Third, Africa is a net consumer of information and technology, contributing significantly to its marginal socioeconomic status compared to other regions of the globe. Karl Marx contended more than 150 years ago that the economic foundation defined the prevailing institutions and ideas. Even if this was true in his day, it's not the situation now. The distribution of political and economic power and influence is determined mainly by the global structure of information and ideas.

Societies like many African governments that are wealthy in natural resources but lack modern technology and knowledge may prosper less than those that do. Indeed, the states rich in expertise and modern technology will likely have more significant global influence, even if they have poor natural resources. This is one of the reasons why a natural resource-poor country like Japan is wealthier and globally more influential than a natural-resource-rich country like the Democratic Republic of Congo, which is inadequate in knowledge.

Africa is disadvantaged by the existing global framework or structure of knowledge, which requires African academics to strive toward producing information with potential for international application. To go in this direction, the African Union and its member states must devise plans and procedures that will enable African scholars on the continent and in the diaspora to continuously take advantage of globalization processes to produce new knowledge for the continent. As previously said, globalization entails universalization, harmonization, and uniformity, leading to marginalizing African institutions, values, and customs. Globalization has been linked to prioritizing "Western rational scientific knowledge... at the expense of local knowledge" in terms of knowledge.[17] It has been charged as weakening "the value of local diversity" by providing "legitimacy to the dominant liberal agenda."[18] While it is true that Indigenous and religious knowledge systems have been threatened by globalization, particularly in the information age and digital culture, this has not always been the case. Some aspects of globalization have provided excellent opportunities that the AU and its members can exploit, but only if African governments invest in science, technology, innovation, and the humanities and social sciences. In other words, globalization could bring Africa globalization from the cold.

The AU and its members would need to invest in the knowledge sector to capitalise on the dynamics of globalisation fully. African governments and their citizens would discover that they were not total losers in the processes of globalisation if they had the appropriate policies, strategies, and institutions in place. According to Calestous Juma and Ismail Serageldin, co-chairs of the High-Level African Panel on Modern Biotechnology (henceforth, the African Panel on Biotechnology), "Africa's 'distance' from the centres of technological origin is a source of creativity in applying existing technologies to new uses and therefore expands the prospects

for international cooperation."[19] The 1999 *Human Development Report* discussed ‘‘globalisation with a human face,’’ namely a form of globalisation predicated on ethics, equity, inclusion, human security, sustainability, and development.[20] The challenge for African policymakers is to utilise African researchers and specialists to reconstruct globalisation with a human face. We can explore development within the context of this type of globalisation.

What Does Development Entail?

Marcus Garvey characterised development in Africa as the continent's persistent and unceasing quest for self-improvement. Africans consistently and repeatedly improved their lives and opportunities before colonisation, just like any other human being. In many respects, they were creative and ingenious. The *African Intellectual Heritage: A Book of Sources* by Molefi Kete Asante and Abus S. Abarry is available for reading and includes African works of creativity, imagination, political engineering, cultural dynamism, religious and economic complexity, and originality.[21] Africans are shown in this piece as active, self-sufficient domesticators of both flora and animals. From stone to iron tools, their technologies advanced. They moved in quest of better settings that would increase their prospects of success in life. Lineages, clans, chiefdoms, kingdoms, states, and countries of all sizes and complexity were among the sociopolitical structures they created. Africans engaged in introspection about their origins, the meaning of life itself, and what it meant to be human, just like other people. For this reason, the first section of Asante and Abarry's book focuses on African myths about "the creation of the universe."[22] For instance, foundational myths and stories encapsulated African meditation traditions. Like all humans, Africans created intricate theological concepts due to their continual and consistent attempts to make sense of their surroundings and way of life.

However, the past 500 years of African history raises a fundamental question: What does development mean for a people fighting to break free from the oppressive legacies of colonialism, imperialism, apartheid, neocolonialism, underdevelopment, and the imposition of neo-liberalism and the Washington Consensus? When combined, these antagonistic mechanisms form what several scholars from Latin America, like Anibal Quijano, Walter D. Mignolo, Ramon

Grosfoguel, Nelson Maldonado-Torres, and others, have referred to as "coloniality."[23] Coloniality is the subdued component of Euro-North American-centric modernity that encapsulates the detrimental effects of modernity outside of North America and Europe.

African academics who emphasise the structural straitjacket that ensnared Africa and the paradigm of difference it initiated, like Peter Ekeh, prefer to refer to it as "colonialism."[24] According to Ekeh, "colonialism" is more complex than the simple idea that Europeans conquered and ruled over Africa. Instead, it has to be seen as an epochal-scale systemic social process with long-lasting effects extending beyond direct colonialism's end.[25] Kwame Nkrumah captured the long-term consequences of colonialism and coined the term "neocolonialism" 26, and Walter Rodney articulated it in terms of "how Europe underdeveloped Africa".[27] In agreement with this epic school of colonialism, Ali Mazrui concluded that "what Africa knows about itself, what different parts of Africa know about each other, has been profoundly influenced by the West." He described colonialism as "a revolution of epic proportions."[28]

Samir Amin argues that there is no "implementation of the principle of auto-centric development" free from "economic rationality observed by conventional economics" in Africa, highlighting the epistemic consequences of Eurocentrism and colonialism on African notions of development.[29] Like many other worldviews that flow from Europe and North America, conventional economics is a collection of regional notions made global. They are Eurocentric. Because it mistakenly imagined Europe as the centre of the universe and the source of all morality, Samir Amin called Eurocentrism one of our time's worst "ideological deformations".[30] Ngugi wa Thiong'o called what was released during the colonial and imperial era of Euro-North American-centric modernity a "cultural bomb" and elaborated on the long-term consequences in this eloquent manner:

The effect of a cultural bomb is to annihilate a people’s belief in their names, in their language, in their environment, in their heritage of struggle, in their unity, in their capacities and ultimately in themselves. It makes them see their past as one wasteland of non-achievement, and it makes them want to identify with that which is furthest removed from themselves, for instance, with other people’s languages rather than their own. It makes them identify with that which is decadent and

reactionary, all those forces which would stop their springs of life. It even plants serious doubts about the moral rightness of struggle. Possibilities of triumph or victory are seen as remote, ridiculous dreams. The intended results are despair, despondency and a collective death wish.[31]

African conceptions of development remain a struggle for what Ngugi wa Thiong'o understood as "remembering," that is, a quest for wholeness after over five hundred years of "dismemberment" due to the lingering legacies and realities of enslavement, colonialism, imperialism, apartheid, neocolonialism, underdevelopment, and structural adjustment programs, as well as the new race for African natural resources.[32] From the standpoint of decolonial "remembering," development is essentially a healing and restoration endeavour.[33] Following 1945, many Africans and other formerly colonised peoples called for the right to development to be recognised as a fundamental human right. This made sense in a world where it was well understood that the confluence of colonisation, apartheid, slavery, and neocolonialism actively prevented the development of the parts of the world that were subject to colonial differences.

Several academics, like Andre Gunder Frank, had already identified peripheralisation as the root reason for reliance and the lack of growth in formerly colonised areas before Rodney published *How Europe Underdeveloped Africa* in 1972. Dependency studies accurately recognised restrictive structural circumstances resulting from recognisable historical events flowing from the encounter between Africa and Europe, despite criticisms regarding its limitations. This reliance remains a fundamental aspect of the unequal relationships between Africa and Europe, even after sixty years of "decolonisation". Accordingly, the "myth of decolonisation" must not be applied to African development concepts.[34]

In this instance, development is essentially a process of re-humanization following many years of denial of humanity and an effort to stop reliance. Maldonado-Torres provides extensive documentation of this denial of being under the heading "coloniality of being"[35], which precisely describes the "technologies of dismemberment" that underlie "genealogies of dismemberment."[36] Among the methods of dismemberment are dispossessions, alienation techniques, linguicides, and genocides. Thus, the African understanding of development revolves around the struggle to reclaim ontological density that has been denied, if not completely

lost. To further explore the African concept of development as a component of ongoing battles to move from the "zone of non-being" to the "zone of being," one may even refer to Frantz Fanon's concepts of the "zone of being" and the "zone of non-being."[37] African people were made to live in the zone of non-being, a place created by colonialism. It is typified by suffering and wickedness.

At the global level:

'development' in our time is such a central value. Wars are fought and coups launched in its name. Entire systems of government and philosophy are evaluated according to their ability to promote it. Indeed, it doesn't seem easy to find any way to talk about large parts of the world except in these terms.[38]

African leaders were inevitably so enthralled with the post-1945 developmental promise that they firmly believed that not only would decolonisation result in their taking control of the colonially constructed colonial state but that they would also achieve full sovereignty, granting them the ability to embark on independent developmental trajectories intended to improve the socioeconomic conditions of the formerly colonised peoples as well as reduce economic inequality between ex-colonies and former colonial powers. However, "the promised land of development remained an illusion" 60 years after the start of decolonisation.[39]

There are two perspectives from which to understand development now. The first is a technicist-liberal perspective that is ahistorical and apolitical. This viewpoint offers three definitions of development. To begin with, development is defined as a desired society's vision, description, or assessment of its current status. Second, development is viewed as a protracted process of social transformation that alters societies. Lastly, the development comprises conscious endeavours meant to enhance human life.[40] The problem with the ahistorical and apolitical approach is that it does not take into account the realities of world power and global interests, as well as colonial matrices of power that constitute the discursive context within which the notions of development emerge, are defined and articulated, contested and questioned. For Africa, the long-standing challenge has been how to decolonise and democratise the racially hierarchised and Euro-North American-centric world system that is informed by power politics and coercion.

Joseph Pieterse views development as a highly contentious concept caught up in "a terrain of hegemony and counter-hegemony" and as a comprehensive process of "remembering" a historically "dismembered" people from a historical and political standpoint.[41] By using this method, it is possible to speak to African concepts of development that are influenced by decolonial liberatory theory while also capturing contemporary views of development as an idea and discourse. Simultaneously, this methodology acknowledges the popularisation and universalisation of growth as a human goal confined to post-Enlightenment modernist notions of advancement.[42]

The post-1945 Truman version of development, which argued that modern history had given North America and Europe the mission to create the Third World in their image, was the pinnacle of post-Enlightenment development ideas.[43] What Fantu Cheru called "the imperial project," driven by geopolitical concerns, the Global North's power calculations, and the constant language of humanitarianism that masks colonialism, is at the core of the Truman version of development.[44]

The Truman version of development is deeply situated in the long history of the making of the modern world system and the invention of Africa, accompanied by what Valentin Y. Mudimbe terms the "paradigm of difference".[45] It is traceable to what became known as "voyages of discovery" that opened the way for mercantilism, the slave trade, imperialism and colonialism. These processes were articulated from a colonial perspective as entailing the spreading of civilisation, modernity, commerce and Christianity to those places such as Africa that were described as the "heart of darkness".[46] Consequently, development as an offspring of Enlightenment and modernity became entangled in a complex and long history mediated by the logics of coloniality informed by domination, oppression and exploitation, on the one hand, and the rhetoric of modernity that promised a brave modern society where salvation, civilisation, progress, economic growth, freedom and democracy would be the order of life, on the other.[47]

Following the Bandung Conference 1955, the decolonial Bandung development version began challenging the Truman version. The Bandung version defined development as a human right that requires advocacy and as a means of freedom.[48] However, African struggles for development and decolonisation have remained enmeshed in the hegemonic Truman version of development, supported by the

Breton Woods Institutions (BWI), which provide funding for the execution of an external development agenda and what Adebayo Adedeji called the "development merchant system" (DMS).[49] What David Slater called the "imperiality of knowledge"—produced by the "interweaving of geopolitical power, knowledge, and subordinating representation of the other"—is at the core of the DMS.[50] Long after administrative colonialism was dismantled, the DMS continued to be colonial. It views Africa as "ready to be penetrated, worked over, restructured and transformed" by foreign forces and as home to a people "shorn of the legitimate symbols of independent identity and authority."[51] The World Bank (WB), World Trade Organization (WTO), International Monetary Fund (IMF), intergovernmental organisations (IGOs), and multinational companies (MCs) are members of the consortium that makes up the DMS. As they carry on with the Truman version, they promote a "Bretton Woods paradigm" of development.[52]

At another level, the Bandung decolonial version of development continues to contest the Truman imperial version of development through enabling the crafting of counter-hegemonic development initiatives and strategies that included: the formation of the Organization of African Unity (OAU); the demand for a New Economic International Order (NIEO); the crafting of the African Declaration on Cooperation, Development and Economic Independence of 1973; the Revised Framework of the Principles for the Implementation of New International Economic Order in Africa of 1976; the Lagos Plan of Action for the Economic Development of Africa of 1980; the African Priority Programme for Economic Recovery of 1986; the African Alternative Framework to Structural Adjustment Programme for Social Economic Recovery and Transformation of 1989; the African Charter for Popular Participation for Development of 1990; the United Nations New Agenda for Development of Africa of 1991; and the current New Partnership for African Development (NEPAD) of 2001.[53]

The Bandung version emphasised human development similarly to the "United Nations paradigm." The ideals of non-alignment, South-South solidarity and decolonisation were the foundation for the Bandung Conference. The conference, which advocated for a New International Economic Order (NIEO), set the stage for the fight to democratise and decolonise international society to get fair representation in global decision-making organizations.[54] Beyond colonialism and

coloniality, as well as independence, self-determination, and self-reliance under state mediation and guidance, were the phrases used to describe development.[55] The freedom of states to select their own political and economic systems was also supported by the Bandung Conference.[56] For all the states that emerged from colonialism, nationalism and development were articulated as inseparable processes simply because colonialism denied Africans both development and freedom. Therefore, in Africa and other ex-colonized parts of the world, nationalism and developmentalism constituted efforts at "remembering" those dismembered societies and peoples to regain their lost ontological density.

Development has always involved normative and ethical considerations, whether sustainable or not. It is concerned with satisfying fundamental material requirements and realising human dignity, including meaningful engagement in communal activities. As such, it has both qualitative and quantitative dimensions. Regarding basic requirements, development is about making life better for people. This includes but is not limited to, giving them access to food, shelter, healthcare, and education. Development, however, also refers to governance, or the ability of the populace to take charge of their own lives and conduct their own business. It encompasses capacity building, which suggests adopting fresh concepts, norms, institutions, standards, and methods for getting past barriers to advancement for humanity. All African governments claim that they should be judged on their ability to bring about development. Therefore, development serves as a legitimating norm for African governments.

The definition of development has not always been as inclusive as it is now. For instance, following World War II, development was quantified in terms of GDP and linked to self-sustaining economic growth and decreased poverty. Subsequently, it was believed that wealthy nations and former colonial powers owed it to the newly independent African governments to help them flourish. Walter Rodney contended that Africa's underdevelopment and poverty were caused by a dialectical process that included the development of Europe in the late nineteenth and early twentieth centuries.[57]

During the 1960s and 1970s, some scholars contended that "development" encompassed fair income redistribution inside states and initiatives to disperse resources between nations. The ethical belief that all individuals are equal and

should have equal growth opportunities gave rise to the concept of equitable development. Development was still only conceptualised in terms of economics. When wealthy nations did offer aid to African governments, it was usually in the form of significant economic initiatives meant to raise GDP. While significant parts of the people in several African states were living in substandard conditions, the GDP of such states was expanding. This form of development was criticised by those who argued that while growth was purely economic and vertical, development was horizontal and was supposed to be measured, in part, by the level and intensity of such social services as health, education, shelter, and water.

Since the 1980s, development has meant much more than economic progress. Policymakers and scholars now talk of development that has human, social, political, and economic dimensions. At first, this move away from the narrow economic-oriented development included the provision of basic needs such as shelter, water, sanitation, education, and health. This expanded definition has been reflected in the UNDP's *Human Development Report*, which, since 1990, has listed several indicators of a country's development, including maternal and infant mortality rates and the bridging of the gender gap. In this sense, development describes many activities and processes encompassed in human security and peacebuilding.

Women and Shelter

Women are a valuable resource that African policymakers may use most effectively in development. In the 1950s and 1960s, African women's contributions to the liberation movement were acknowledged. African women, for instance, have "shown themselves to be of paramount importance in the revolutionary struggle," according to Nkrumah's 1968 argument. Their "active support to the independence movement in their various countries" was evident. In certain instances, their valiant involvement in protests and other political actions significantly impacted the result.[58] Nevertheless, after gaining independence, African nations ignored women's responsibilities in the new society. Indeed, at this writing, African women could have been represented better in parliament, senior government positions, universities, and the professions.

Women were subjected to discrimination in the colonial-era educational institutions. African norms that are now outdated have also long held back women. The social and legal structures that support the unequal treatment of men and women continue to exist in many African communities even though colonialism and globalisation undermined many other African institutions. As to the 1999 *Human Development Report*, Burundi, Burkina Faso, Ethiopia, Guinea-Bissau, and Niger were the five African nations ranked lowest globally in the gender-related development index.[59] Once more, three of the world's lowest five nations in terms of women empowerment metrics came from Africa: Niger, Togo, and Mauritania. Any system of government that discriminates against part of the population is ethically deficient. The AU has given women prominent positions and is committed to gender mainstreaming. However, many African states have yet to implement structures, policies, and strategies to expedite women's empowerment.

In the same way that many African nations have only given gender mainstreaming token attention, they have also disregarded the role that shelter plays in development. There are at least two ways to interpret the word "shelter." In the first sense, shelter refers to a physical place, such as a house, apartment, or other type of habitation. In a second meaning, shelter encompasses more than just a roof. Identity, security, and dignity are the primary concerns. The two meanings of shelter are related since a home, settlement, or suitable place to live aids people in achieving a feeling of identity, security, and dignity. These two views of shelter appear to have been in the minds of the delegates to the first UN Conference on Human Settlements in Vancouver, Canada, in 1976, which established the UN Centre for Human Settlements, or Habitat.

The issue of shelter was tackled from these two perspectives in subsequent international events, such as the second UN Conference on Human Settlements (Habitat II) in Istanbul, Turkey, in 1996, the 1987 celebration of the International Year of Shelter for the Homeless, and the Global Strategy for Shelter to the Year 2000. For instance, the heads of state and government endorsed "the universal goals of ensuring adequate shelter for all and making human settlements safer, healthier, and more livable, equitable, sustainable, and productive," according to the Istanbul Declaration on Human Settlements (paragraph 1).[60] The two topics of

"adequate shelter for all and sustainable human settlement development in an urbanising world" were adopted by UN member states, including all AU members.[61] But, how does shelter relate to development processes? Constructing a shelter requires using materials from the environment, such as wood, aluminium, cement, and sand. The challenge for African policymakers is to explore what materials are available for shelter construction.

Keto Mshigeni claims several bamboo species, some of which grow up to 90 centimetres daily, are found throughout Africa. Some bamboo species have wood that is as strong as steel in terms of tensile strength. Given this, African countries should investigate methods for growing bamboo, which may produce construction materials. According to Mshigeni, bamboo has additional applications. For example, some bamboo species include lignocellulosic wood, which helps make paper. Some are great at crafting fine furniture, including flutes and other musical instruments. Some are as good as firewood. Additionally, its superb, fast growth rate and ability to produce many new shoots from a single planting has excellent potential for preventing soil erosion and promoting environmental conservation.[62]

Shelter is a human right as well as an aspect of development. In 1987, Javier Perez de Cuellar, a former UN Secretary-General, contended that housing was "a basic human right and necessity."[63] The idea that housing is a fundamental human right implies that it would be a human rights violation for African countries to fail to provide suitable shelter. In light of this, the slums of Cairo, Johannesburg, Lagos, Nairobi, and other large cities constantly remind the governments of transgressions of international law in Egypt, South Africa, Nigeria, and Kenya, respectively. It is important to remember that homelessness is not exclusive to Africa. Even rich countries like the United States, the UK, France, and Australia have their share of people without shelter.

However, the international standards about shelter suggest that the ability of African governments to offer refuge to their inhabitants is a prerequisite for their legitimacy. "The conditions in which people live determine to a greater extent their health, well-being, and ability engage in a gainful occupation, to pursue self-improvement through education and recreation and, in consequence, to attain a better standard of living," Perez de Cue´llar said at the January 1987 International Year of Shelter for the Homeless.[64] Ensuring that their population achieves this

right is the duty of the AU and its members, working with civil society groups and the developed world.

Rights and Empowerment

Is development a human right if shelter is a human right and it is a component of it? The 1948 Universal Declaration of Human Rights (UDHR) and the 1966 International Covenant on Economic, Social, and Cultural Rights recognised development as human rights. Thus, African academics and decision-makers have maintained that development is a fundamental human right for many years.

However, only in the 1990s did Western nations acknowledge development as a human right. The US administration abstained from voting on the UN Declaration on the Right to Development in 1986. Many other Western nations refrained from voting. The West has recently caught up to Africa and now views development as a human right. "Democracy, development, and respect for human rights and fundamental freedoms are interdependent and mutually reinforcing," according to the Vienna Declaration and Programme of Action adopted during the 1993 World Conference on Human Rights in Vienna.[65] For governments in Africa, this has several ramifications. As the global norm of development is predicated on the understanding that richer countries have a moral obligation to assist the poorer, Africa's poverty can be blamed on the whole world.

Development and democracy are closely related, as stated in the 1993 Vienna Declaration and Programme of Action. In fact, since the 1990s, it has become more widely acknowledged that social progress, democracy, education, and the ability of the populace to choose their futures are essential components of development. Democracy and development go hand in hand since it is hard to characterise a people as developed unless they have a significant role in community administration. A hamlet, clan, ethnic network, grassroots group, local council, or the entire nation can all be considered parts of the community. Development now includes democratisation, an impartial judiciary, and an accountable, transparent, and responsible administration. This brings into focus the relationship between knowledge, empowerment and development. When he underlined in 1995 that development "can only succeed if it responds to the needs of the people, and if it articulates these needs into a coherent policy framework," former UN Secretary-

General Boutros Boutros-Ghali seems to have had this in mind.[66] Knowledge may be shared through capacity-building seminars and workshops, which will make individuals more receptive to liberal democratic concepts and motivate them to engage in the development process more successfully.

During his April 2020 explanation of the multipurpose nature of sisal, Mshigeni raised some thought-provoking remarks on the relationship between knowledge development and empowerment. Tanzania's sisal business has been centred on leaf fibres for over a century. But the "huge basal bulb of the sisal plant is very rich in sugars," claims Mshigeni.[67] What if sisal farmers were instructed on extracting and using the sugar from sisal through a workshop? They would be able to produce citric acid and alcohol from sisal sugars. In addition, Mshigeni states that the "residue left after extracting the leaf fibres" is "very rich in hecogenin, an aromatic compound with vital medicinal potency for treating heart ailments."[68] Thus, through empowerment workshops, ordinary farmers in Tanzania, Kenya and other places where sisal is grown can be enabled to transform sisal into a beneficial commodity. It is a challenge for African policymakers to work with scientists to find ways of empowering ordinary people, especially women, to use objects in their everyday lives to participate in development.

Additionally, there is a strong connection between human security and progress. Indeed, several scholars have offered comparable definitions of progress and human security. Human security, like growth, is about people's individual and community quality of life. Human security is "pursued for the majority of humankind as part of a collective, most commonly the household, sometimes the village or the community defined along other criteria such as religion or caste," according to Caroline Thomas, who also claims that it "has both qualitative and quantitative aspects."[69] Thomas says that "achieving human dignity, which includes personal autonomy, control over one's life, and unhindered participation in the life of the community," is another level at which "human security" is about meeting one's fundamental material requirements.[70] She notes that liberation "from oppressive structures—be they global, national, or local" is necessary for human security.[71] Therefore, the broad meaning of development and human security refers to the same kinds of endeavours, outcomes, and procedures.

This conversation has brought attention to how globalisation processes drive development, which is also closely linked to human security and sound governance. This implies that the AU may seek security, gender equality, respect for the rule of law, good governance, and development using comparable instruments. The member states' progressive legal and political frameworks must be strengthened for these instruments to remain viable.

Political and Legal Climate

Governmental and legal frameworks, or governance structures, are essential for creativity and knowledge production. Intellectual capital is as powerful as any nation's political and legal environment. The low quality of African states' knowledge bases can be partially attributed to their governing systems. African states can only respond to calls for increased expenditures in research, technology, and innovations if they reform their legal and political structures. Knowledge creation investments require a hospitable political-legal environment, much as foreign direct investments require supporting governance institutions.

Africa has several challenges in its efforts to produce knowledge effectively. First, university teachers and researchers receive very little compensation in many states. The only exception is South Africa, although even there, the pay for academics needs to catch up to that of other professions. The absence of flexibility in job circumstances is the second barrier. Hardworking researchers and lecturers receive no rewards, and no finances are available to employ the top researchers. The third is the limitations placed on researchers by their institutions. All that is required for researchers to do research in industrialised nations is funding. While university ethics committees may encourage adherence to ethical standards, they may not impose them. However, in many African states, researchers need research clearance certificates, and obtaining them can often take many months in some states. The fourth obstacle is the unwillingness of the political elite to recognise that competent researchers can provide helpful input into the policy process.

For African governments to use information generated domestically and internationally, the policy establishment must reorganise their governance frameworks in several ways. First, we may create more flexible and appealing research environments by rethinking political and legal frameworks to

accommodate advances in the humanities and social sciences, science, technology, and other domains. By financing these projects, the donor community may significantly motivate African nations to take action. By implementing such policies, Africa may gain from a highly trained and mobile labour population and establish suitable knowledge economies. Different African governments and sub-regions may have different knowledge-friendly governance arrangements needed to participate in the advantages of the global knowledge economy. The requirement for workforce flexibility should be addressed by appropriate structures and methods that can also adapt to scientific, technological, and artistic advancements and change tax laws, particularly those concerning the import of equipment used in knowledge production. In addition, they must address gender issues, environmental concerns, participatory democracy, and human rights.

The second stage is establishing a system for suitably incorporating innovation, research, and technology into development goals. Although many African nations are interested in the advantages of innovation, science, and technology, several need more policy frameworks to adequately incorporate these fields into development goals. Some of this may be attributed to the design of governance institutions, the absence of strategic leadership, and the need for more qualified workers. Since genetic engineering is still relatively new and may be dangerous and unclear in its current state, several critics have legitimately voiced concerns about it. The scientific community—including biotechnologists, ethicists, and environmental specialists—must address this issue, but doing so is impossible without an appropriate governing framework. Through new governance structures and processes, African states can meaningfully integrate science, technology, and innovation into development plans and develop relevant knowledge economies.

The third phase is creating governance structures considering indigenous contributions and global factors. Because African nations are members of the worldwide community, some institutions, laws, and social mores that govern life in other nations, have influenced the political and judicial systems. For instance, developing knowledge-friendly governance frameworks in Africa would need to consider the advances in agricultural innovation, global information flows, and biotechnology and biomedical research revolutions. This might assist African nations in utilising cutting-edge technology to enhance their harvests, cultivate in

semi-arid regions, and capitalise on their biodiversity reserves. It also may facilitate the development of strategic partnerships between African universities and research centres and their counterparts abroad. Therefore, African policymakers must recast their governance structures to tap into knowledge that reflects the changes in global norms while at the same time serving local needs.

On the other hand, foreign institutions can only be introduced into Africa by considering African customs. The good parts of current practices were ignored by the structural adjustment programs (SAPs), which the World Bank and the International Monetary Fund (IMF) supported starting in the 1980s. Therefore, SAPs had a hand in weakening the body of technological knowledge across several industries. The newly established organisations must mirror Africa's progressive norms, attitudes, and standards. Indigenous Africans possess expertise that might be useful in agriculture, medicine, and environmental management in the future. Under this situation, African universities can be crucial in determining the depth and breadth of Indigenous values to be included in the knowledge banks. Knowledge production demands that African policymakers promote and experiment with policies that incorporate social learning. Social learning encourages borrowing from other countries but requires a greater understanding of African universities and research centres' evolving social, cultural, economic, and scientific contexts.

Redesigning governance systems incorporating workplace flexibility and incentives allows for the inclusion of Indigenous expertise and considers evolving global standards and best practices, which should thus be a top priority for the AU and its members. Policymakers must acknowledge the potential of universities and research institutes to contribute to policymaking processes through issue identification and solution suggestions.

Capacity Building

Out of all the global regions, Africa has the least capability for science. Africa was a spectator in most world scientific matters, according to the 2018 UNESCO *World Scientific Report*. Not only has it not influenced the creation of new materials and goods, but it has also not significantly impacted the rapidly evolving and expansive information technology and communications sector.[72] According to

a 2012 census conducted by UNESCO, Africa has 20,000 scientists and engineers, or 0.36 per cent of all scientists worldwide. Just 0.8% of all scientific publications worldwide were written by these professionals. Africa's share of patents is "close to zero," and whether it has produced a Nobel laureate for any scientific discipline is unclear. There are no "patents, scientific publications and technological innovations, the common yardsticks for science and technology output" in Africa. Africa's unstable science, technology, and innovation state can be attributed to domestic political-economic factors. The first is the need for governmental backing for national initiatives in science and technology. An Ethiopian scientist who attempted to extract a soap component for commercial use from a soapberry plant in the 1990s and moved to an American institution after giving up due to a lack of government backing is an excellent example of the lack of dedication to the scientific effort. Not only did the American academics he was collaborating with uncovering more possible uses for the chemical, but they also purposefully withheld their results from the Ethiopian scientist. They then developed the ingredient into a prosperous anti-bilharzia treatment, patented their discovery and sold it to a pharmaceutical company for millions of dollars. If the Ethiopian government had supported its scholars, the scientific and financial benefits would have accrued to Ethiopia and its scientists.

The second, connected to the first, is the pitiful amount of money that research and development and scientific teaching receive at universities and research centres.[73] To be sure, several African universities and other training institutions need more resources for research, mismanaged and ignored, and they provide little solutions to the continent's information demands. The UNDP *Human Development Report* 2016 states that 0.09 per cent of Africa's GDP is allocated to research and development.[74] African research institutes nearly entirely rely on foreign donations due to the need for more support from national governments; as a result, they create information that advances the interests of their funders. African research institutes would only be able to exist with such outside assistance. While this kind of funding may seem like a lifeline for African research organisations, it also forces African academics to further the funding source's research goal. As a result, these institutions hardly ever generate new information that advances African interests. The "need to shift from dependence on relief models to a new emphasis on

competence-building" has been emphasized by the African Panel on Biotechnology.[75]

The third phenomenon is the "brain drain," or exodus of scientists from Africa to other regions of the world. Most scientists have departed the continent for more favourable conditions in Europe and North America, as most research institutes are underfunded and lack current research equipment. Africa has lost many scientists since the 1960s due to inadequate pay, outdated research tools, and other issues.

The African brain drain is enormous in both quantity and expense. By 2021, the continent was projected to lose 20,000 highly qualified workers annually.[76] Professionals with extensive training, such as physicians, engineers, and other scientists, made up most of them. Due to the civil conflict and unfavourable scientific climate, Algeria has lost an estimated 45,000 of its academics and researchers since 1992. By depriving Africa's fragile economies of its most significant human resources and by recruiting expats at an estimated cost of $5.6 billion annually, the brain drain places "brain strain" on development.[77] The African Panel on Biotechnology has recommended the establishment of African Regional Innovation Communities as a solution to these and related issues.[78] This approach has merit because the production of scientific knowledge in Africa is severely hampered by the lack of, or obsolete and dilapidated, infrastructure. This situation has compelled African scientists to operate in environments where they perform routine tasks that contribute little or nothing to scientific innovations.

"The developed nations constitute only 21% of the world's population, but 3 out of every 1,000 of their population are researchers, and they own 84% of the world's research articles and 97% of research patents," says Zola Mbanguta, chair of the UNESCO Science Commission and director of the CDIO Institute for Africa. Although 79% of the world's population lives in poor countries, just 1 in 3,000 are researchers, accounting for only 16% of all research publications and 3% of all research patents worldwide.[79] Programs for calibrated capacity building are required to address this gap.

The phrase "capacity building" frequently includes extensive endeavours associated with education, knowledge gain, and application. Capacity building, for instance, is described as "the strengthening and development of human resources and institutional capacities" by the United Nations Environment Programme

(UNEP). It entails knowledge transmission, the construction of suitable facilities, training in biotechnology-related safety sciences, and the application of risk assessment and management.[80] In this context, "capacity building" refers to developing the human resources, social structures, and other tools required to carry out certain activities, such as producing knowledge from local and international sources. It describes the creation of conditions and organisational structures through which African societies can achieve human welfare, participatory democracy, peace, and socio-economic justice.

Capacity building is a process of learning and applying information that legitimises imitation. This suggests that people are encouraged to use the abilities, strategies, and tactics of those they view as "successful" to solve issues in their circumstances through capacity development. Building capacity is essential to developing and effectively using innovation, research, and technology. Unfortunately, there are still surprisingly few suitable organisational structures and organisations for capacity building throughout the continent at this point in Africa's development. Because of this, building institutional capacity in Africa continues to be a top focus. Successful Asian states like Japan, Malaysia, Singapore, South Korea, and Taiwan care more about capacity building than African states. The problem with this example is that these states built their intellectual capital under authoritarian or semi-authoritarian regimes, which African states must avoid. African governments may need to imitate some features of these nations' growth, such as their sufficient investment in capacity building. African countries have little chance of building the infrastructure necessary to break free from the cycle of poverty if they do not take this action.

Donor nations maintain that think tanks and research institutes should be included, although others have questioned the neoliberal epistemological and methodological constraints imposed on these institutions. In addition to the previously stated Institute of Security Studies, Africa is home to several prominent research institutions. The Council for the Development of Social Sciences Research in Africa, the Kenya Institute of Public Policy Research and Analysis, the UN University Institute for Natural Resources in Africa, the African Centre for Technology Studies, the African Economic Research Consortium, and the African Centre for the Constructive Resolution of Disputes are a few of these. These and

related organisations' goals, proficiencies, and efficacy differ significantly. The financial, political, and legal limitations they encounter also vary depending on their place of operation. Some of these research centres conduct rigorous policy analyses and influence state policies. However, unless some of them move out of their neoliberal straitjackets, they will unlikely support consistent policies predominantly geared towards human welfare, participatory democracy, and socio-economic justice.

African governments will eventually need to find new approaches to capacity building. With little foreign help, the wealthier African nations—such as South Africa—might be able to train their staff in most fields. More complex tasks lie ahead for the poorest states. They would have to reorganize, choose strategic leaders, and provide sufficient funding for their universities. Policymakers in these states would need to look at the possibility of establishing regional institutes to assist in developing the ability to improve their knowledge bases if they cannot fund these steps. In their proposal for regional innovation centers, the African Panel on Biotechnology offered a plan based on the five sub-regions of Africa: Central Africa, Eastern Africa, North Africa, Southern Africa, and West Africa.[81] Ensuring that top-notch research leaves university campuses and enters government ministries is a top priority for African policymakers. Furthermore, African policymakers and educational leaders must expand and strengthen their research collaborations with industry, wealthy nations, and other emerging regions. Using these collaborations, they might obtain some of the expertise and resources required to assist their communities in building robust knowledge foundations. These policies will clear the way for Africa to develop a competitive knowledge economy.

Conclusion

The reality about the African struggle for development in all ramifications is that it is taking place within a modern world system resistant to decolonization and an international order that consistently works towards disciplining anti-systemic movements and forces to give the world system a new lease of life. The world system and its shifting international orders continue to subject African development initiatives and plans to the logic of classical economic thought and

the dominant logic of capitalist accumulation that created Africa as a periphery. This is why the Bandung spirit was consistently frustrated, and the African demand for a new international economic order was vehemently resisted.

The acceptable development model for Africa in the eyes of those in the Global North is one whereby African economies are adjusted and aligned to the imperatives and demands of the international division of labour. Africa has always needed more development initiatives and plans. Still, the imagination of auto-centric development outside the template cascading from classical economic thought and capitalist imperatives has required to be improved. The DMS works actively to prevent and destroy any development initiative that threatens to subvert the modern world system and its international order.

As argued by Samir Amin, Africa has been fighting for a space to originate new economic ideas and imagine new development alternatives suitable for the African reality and experience.[82] Such a space is denied. However, Africa continues to work in cohorts with other developing countries for space and economic justice. Europe and North America must accept decolonization and demineralization of the global system as a means of "remembering" to accomplish the goal of creating a new international economic order. Only a combination of genuine demineralization on a world scale and decolonization would result in a global democracy in which Africa would be afforded space to develop.

Due to its inadequate knowledge, Africa continues to be sidelined in science, economy, politics, and military might compared to other regions of the globe. The African Union and policymakers, in general, face four significant problems as a result of this circumstance. First, African policymakers have to specify the kind of information they require. Knowledge has been applied to various goals, such as waging war on other societies and generating profits for businesses at the cost of labour. African policymakers must determine the necessary knowledge to achieve socioeconomic fairness, participatory democracy, human well-being, and peace. "Sound policy options often follow new understandings," Peter Vale has emphasised.[83]

The second difficulty is facilitating strategic leaders' formation, development, or training. Leaders with strategic vision, whether in business, politics, education, science, technology, or innovation, will be the ones to pull Africa out of its

marginalization. It will be necessary for the donor community to assist by training these leaders and introducing them to excellent practices.

The third challenge is developing the governance frameworks or structures that enable the AU and its members to handle issues in a globalized world better. The African people can leverage indigenous knowledge and modern technology to engage in development thanks to an effectively accommodating politico-legal environment. African governments can produce relevant information and address some of the primary causes of poverty if they change their governance arrangements.

The last task is to modernize educational institutions and other learning hubs, create regional research hubs, and strengthen strategic alliances with prosperous nations. African nations must consider capacity building more carefully to develop the necessary knowledge bases.

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Out of the less than 0.5 percent of the GNP spent on science research, 47 percent goes to research in agriculture, forestry and fisheries.

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See *Daily Nation* (Nairobi) May 19, 2023.

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