

Africa DA

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Russia is challenging US dominance in Africa

Smith 9-13-2021 [Elliot Smith, September 13, 2021, CNBC, “Russia is building its military influence in Africa, challenging U.S. and French dominance”

<https://www.cnbc.com/2021/09/13/russia-is-building-military-influence-in-africa-challenging-us-france.html>] //neth

In the past two months alone, Russia has signed military cooperation agreements with Nigeria and Ethiopia, Africa’s two most populous nations.

The Stockholm International Peace Research Institute estimates that Africa accounted for 18% of Russian arms exports between 2016 and 2020. Russian mercenaries have also provided direct assistance to governments in Libya and the Central African Republic, according to the U.N. However, the Kremlin has denied links to the Wagner Group, a paramilitary organization alleged by the U.N. to be aiding human rights abuses in the region. “A group of Russian instructors was sent to the CAR at the request of its leaders and with the knowledge of the UN Security Council Sanctions Committee on the CAR established by Resolution 2127,” a Russian foreign ministry statement said in July. “Indicatively, none of them has taken part in combat operations.” Reuters reported in July that U.S. lawmakers had stalled a planned \$1 billion weapons sale to Nigeria over allegations of human rights abuses by the government. Less than a month later, Russia signed a deal with President Muhammadu Buhari’s administration to supply military equipment, training and technology to Nigerian forces. Although historically a key diplomatic and trade partner of the U.S., Buhari’s government found itself at odds with Washington amid the #EndSARS protests in 2020, and again after a recent fallout with Twitter. Meanwhile, Islamist militant groups such as Boko Haram and the Islamic State’s West Africa Province have continued to wreak havoc in the northeast of the country. **This confluence of factors paying the way for Russian influence-building was also at play in Ethiopia.** Russia has provided support for Prime Minister Abiy Ahmed’s government after Western governments balked at his forces’ military response to an insurgency in northern Tigray. Ethiopia felt the U.S. in particular was aligning with Egypt in the ongoing dispute over the Grand Ethiopian Renaissance Dam. U.S. Secretary of State Antony Blinken further evoked the ire of Addis Ababa in March by accusing forces in Tigray of “ethnic cleansing.” Russian Foreign Minister Sergey Lavrov then met with Ethiopian counterpart Demeke Mekonnen in June. Moscow proceeded with the deployment of election observers to Ethiopia, whereas the EU withdrew its observers, citing “ongoing violence across the country, human rights violations and political tensions, harassment of media workers and detained opposition members.” **Russia has supplied strategic weapons both as a potential defense against any Egyptian strike on the GERD and to aid government forces in Tigray.** “Gains by the Tigray Defence Force (TDF), which has captured parts of the Afar and Amhara regions in recent weeks, make the provision of desperately needed weapons all the more important for Addis Ababa, and Moscow is likely to oblige to such a request, possibly on a buy-now-pay-later basis,” said Louw Nel, senior political analyst at NKC African Economics. **In what Nel flagged as a “sign of things to come,” Ethiopia and Russia signed a military cooperation agreement in July, focused specifically on knowledge and technology transfers.** However, Nel noted that Ethiopia will be “wary of allowing Russian personnel to be deployed there in anything other than a training capacity.” Russia’s foreign ministry was not immediately available for comment when contacted by CNBC.

US private economic involvement in the African space race results in hard power advantages against Russia – the aff gets rid of this possibility

Devermont & Oniosun 2020 [Judd Devermont and Temidayo Oniosun, June 23, 2020, War On The Rocks, “IS THE UNITED STATES LOSING THE AFRICAN SPACE RACE?”

<https://warontherocks.com/2020/06/is-the-united-states-losing-the-african-space-race/>] //neth

Advancing American economic and development goals in Africa will translate into influence in harder national security spheres. Africa’s space industry is projected to grow to over \$10 billion in the next five years, according to Space in Africa’s African Space Industry Annual Report. This is a significant opportunity for the United States to expand bilateral trade with African countries, which rested at a mere \$40 billion in 2018. U.S. companies are well-positioned to sell space equipment and services to African governments. Specifically, the U.S. private sector could build new satellites, sell ground station equipment, provide capacity training, and offer launch services. These investments in the region’s space sector could support America’s goal of substantially increasing two-way trade. **The nascent space industry in several African countries also furthers USAID’s efforts to foster self-reliance, boosting growth and employment in sectors such as telecommunications, navigation, and Earth observation. These systems and services help to**

address major societal challenges including imperfect markets, climate change, scarce resources, health systems, and an aging population. For example, about 61 percent of Africans do not have access to the internet, a problem communications satellites could address. The entire satellite value chain has important implications for U.S. political influence in Africa. The technology transfer process, access to technologies and data, and support for development have the potential to increase U.S. political influence and to deepen national security ties between the United States and African partners.

The United States has historically used space diplomacy in Africa to display U.S. commitment.

These ties have the potential to translate into African support for U.S. positions on data-sharing, safety coordination, and other international space norms. Currently, Burkina Faso is a vice-chair of the U.N. General Assembly's First Committee, which oversees disarmament issues in space; Cameroon is vice-chair on the Fourth Committee, which moderates international cooperation in space; and South Africa is chair of the Scientific and Technical Subcommittee of the ad hoc U.N. Committee on the Peaceful Uses of Outer Space. African support, for example, could add momentum to the U.S. government's new legal framework, known as the Artemis Accords, to govern the behavior of countries and companies in space and on the moon. NASA administrator Jim Bridenstine recently underscored the importance of these norms, pointing out that debris from a spent Chinese rocket stage landed in Cote d'Ivoire. It

also may blunt Chinese and Russian efforts, via state-owned companies, to strengthen their geopolitical influence and surveillance capacity in the region. According to the Defense Intelligence Agency,

China uses its commercial sales "to bolster relationships with countries around the world" and "lead the space community." China established an 18-meter diameter dish in Swakopmund, Namibia in 2001, which some analysts worry could be used to advance the People Liberation Army's (PLA) cyber, space, and networking objectives. China's Great Wall Industry Corporation notched its first foreign sale to Nigeria in 2007, delivering the total package:

satellite manufacture, launch service, ground station construction, project implementation, financing, insurance, and training. The Russians launched Angola's first satellite and will do the same for its replacement later this year.

Russia claims it is currently negotiating with unnamed African countries to deploy Global

Navigation Satellite System (GLONASS) ground stations across the region. China funded Ethiopia's first

satellite and trained its engineers. It also launched Sudan's first-ever satellite, which will conduct Earth observation research for military and civilian purposes. If the United States is not engaged, it has a limited ability to counter and mitigate the risks posed by

adversaries in this sector. The Big Picture The United States has an opportunity to join the African space

race, establishing itself as a major partner in the region's rapidly expanding space programs. Doing so would advance American economic, diplomatic, and national security interests by increasing U.S. trade and investment, deepening ties with influential African governments, and staking a U.S. claim in a sector where China and Russia are increasingly dominant. Washington should build on some of NASA's recent engagements, including an agreement last year with South African National Space Agency (SANSA) to conduct technical and environmental research on the potential to establish a ground station in South Africa. The U.S. government ought to promote the space sector as a key focus area for the Trump Administration's Prosper Africa initiative, showcasing SpaceX's role in launching satellites in Ghana, Kenya, Nigeria, and South Africa. Specifically, Washington should consider providing financial incentives and credits to enable its private sector to compete with state-backed Chinese and Russian firms. Finally, the United States should work with African officials to develop common understandings and positions in international forums to develop norms for outer space, ensuring an even playing field for foreign companies and addressing potential threats to sovereignty. It is in the U.S. interest to be part of this success story — it just has to make the leap.

Russia & China will use weaknesses in US hard power as opportunities to strike

Michta 12-14-2021 [Andrew A. Michta, December 14 2021, "Russia and China's Dangerous Decline," Wall Street Journal,

<https://www.wsj.com/articles/russia-and-china-dangerous-population-decline-indo-pacific-pivot-research-development-taiwan-ukraine-11639497466>] //neth

The risk of confrontation between the U.S. and China is greater than it has been in decades, and a broader war, triggered by a Chinese action against Taiwan, is a possibility. In "Destined for War: Can America and China Escape Thucydides's Trap?" (2017), Graham Allison likened the situation to the Peloponnesian War, which the Athenian historian thought inevitable because Sparta feared the rising power of Athens. Yet the real reason for the current tensions has less to do with the

decline and rise of great powers than with threat perceptions, balance-of-power estimates,

autonomous assessments and internal decisions that have been driving China—and Russia—for

several years now. (They have increasingly aligned in their opposition to the U.S. and the post-Cold War international order.)

The rising threat of high-intensity state-on-state war is driven by the growing elite conviction in Beijing and Moscow that their power disadvantage relative to the U.S. and its allies will worsen unless they move soon, making victory increasingly unattainable. There

are three principal reasons why China and Russia may want to confront the U.S. and its allies

sooner rather than later, possibly within five years. First, the U.S. military will require time to

restructure and refit away from counterterrorism and toward high-intensity state-on-state great-power conflict. The Army Modernization Strategy published in 2019 sets 2035 as the deadline for transforming the Army into a multidomain-capable force. From a Russian or Chinese perspective, that means each additional year will shift imbalances, which currently favor them in some areas, in America's favor. The second factor is domestic conditions in the U.S. and Europe. Western democracies are buffeted by the trifecta of Covid-19; increasingly brazen mass in-migration, to which their governments seem unable to respond effectively; and the cresting cultural revolution, especially in the U.S., which is likely to peak within the next two years. All have strained national cohesion across the West, fed distrust in government, and sowed seeds of doubt that legacy democratic institutions and processes are able to meet the basic requirements of governance and satisfy the citizenry. Once America has moved beyond its current internal 1970s-style turbulence, a reconsolidated U.S., with its key manufacturing supply chains re-shored back from China, will present Beijing and Moscow with a far more formidable foe than today. A good indicator is the recent reports that the U.S. has made a qualitative leap in hypersonic missile technology, likely to nullify the edge Russia and China had hoped to maintain through the investment in their own programs. Notwithstanding their blustery propaganda, Beijing and Moscow are keenly aware that America's research-and-development base can be mobilized to improve U.S. capabilities. Time is on America's side when it comes to the quality and sophistication of its weapon systems. The third factor: internal pressures building within Chinese and Russian societies. For both countries, population trends and current projections paint a devastating picture. In 2021 China reported its first projected population decline since the famine that accompanied Mao Zedong's "Great Leap Forward" in the late 1950s. With the official birthrate of 1.3 children per woman—far below the replacement rate of 2.1, and in part a result of the now-relaxed one-child policy—there are credible projections that China's population will peak in 2022, and that births will continue to decline and deaths will surpass births by six million in 2025. Russia's population is projected to decline from 146 million today to 121 million in 2050. Historically, wars have often started because of miscalculations based on unsound intelligence estimates and underestimating the enemy. In the case of U.S. strategic competition with China and Russia, the risk of war has grown not because of their rise but because of how China and Russia assess the real near-term implications of Washington's decision to refocus its defense strategy on the fundamentals of great-power competition and conflict instead of counterterrorism and nation building. Whether war breaks out will depend on how badly Beijing and Moscow fear the global power shift in the next decade and how eager they will be to exploit their perceived current relative advantages to remake the world.

US-Russia nuclear war causes nuclear winter, blocks out sunlight, kills life on earth

Monzon 2019 [Inigo Monzon, August 20, 2019, "US, Russia Nuclear War Would Cause 'Nuclear Winter' And 'Human Extinction,' Study Reveals," International Business Times, <https://www.ibtimes.com/us-russia-nuclear-war-would-cause-nuclear-winter-human-extinction-study-reveals-2815921>] //neth

A new study has confirmed that the world will be plunged into a nuclear winter following a nuclear war between the U.S. and Russia. According to the study, the war between these two superpowers would trigger a global environmental event that can last for several years. The new study was conducted by a team of researchers from the University of Colorado, Rutgers University and the National Center for Atmospheric Research. It was published in the Journal of Geophysical Research: Atmospheres. For the study, the researchers created a model depicting what would happen to Earth if the U.S. and Russia engaged in an all-out nuclear war. As part of the simulation, the researchers observed what would happen if a large number of nuclear bombs were detonated in urban areas near the U.S. and Russia. In the simulation, the two countries used all of their nuclear weapons. According to the findings of their model, dubbed as the Community Earth System Model – Whole Atmosphere Community Climate Model version 4, the explosions from the nuclear bomb detonations would create a massive amount of smoke that would cover up the Earth's atmosphere. The smoke, which scientists predict would linger for years, will block out sunlight, leading to a significant drop in Earth's temperature. According to the scientists, the winter-like season that will be caused by the nuclear war will last for a long time. It will also trigger other environmental events such as changes to the monsoon and El Niño seasons. The scientists noted that the results of their study agree with the findings of a previous research published in 2007. The similarity between these two studies clearly indicates the inevitability of a nuclear winter following a massive nuclear war. "Despite having different features and capabilities, both models produce similar results," the scientists stated in the study's abstract. "Nuclear winter, with below-freezing temperatures over much of the Northern Hemisphere

during summer, occurs because of a reduction of surface solar radiation due to smoke lofted into the stratosphere.

Add-On/extras

Priv sector key

US-Africa business partnerships check back against Russian escalation

Lechner 5-20-2021 [John Lechner, May 20, 2021, War On The Rocks, "TO COUNTER RUSSIA IN AFRICA, AMERICA SHOULD RETHINK ITS OWN ROLE"]

<https://warontherocks.com/2021/05/to-counter-russia-in-africa-america-should-rethink-its-own-role/> //neth

What would a better set of policies look like in practice? First, rather than lure local elites and authoritarian governments away from Russia — which only fuels extraversion — **Washington should seek positive engagement with African societies at large.** Instead of helping the Kremlin line the pockets of local elite, **the United States should promote small to medium-sized investment in Africa.** Instead of assessing barriers, **Congress should create legislation that incentivizes partnerships between African and U.S. companies.** With the African Continental Free Trade Area coming into effect, Gyude Moore and Bogolo Kenewendo argue the Biden administration has a unique "opportunity to strengthen its strategic partnership with Africa by driving investment toward" the treaty. **Second, America can capitalize on Russia's role in propping up unpopular regimes** ranging from Algeria to **Zimbabwe's.** In the Central African Republic, just a few weeks after his reelection, Touadéra's government shut down two important media outlets; local journalists suspect the move was in response to coverage of Wagner's activities. **The U.S. government can provide crucial support — grants, advocacy, and training — to the independent journalists and outlets battling disinformation and keeping governments accountable.** Third, Russian mercenaries inevitably commit human rights violations and become unpopular over time. The United States should continue to monitor, and sanction, Prigozhin's activities. But America should go beyond sanctions. In fragile states like the Central African Republic, the U.S. has a great opportunity to focus on the drivers of conflict. Indeed, investment in conflict resolution and more effective aid is the best way to show that "America is back." Ultimately, **the United States** and its allies cannot have their cake and eat it too. **They cannot effectively "counter" Russia's (or for that matter, China's) illiberal presence in Africa while pursuing status quo.** War on Terror policies to combat Salafi jihadist **insurgencies.** Correcting these inconsistencies means making deeply difficult, and uncomfortable, changes to policy: sacrificing short-term "stability" — as seen from Washington at least — in favor of democracy's inherent uncertainty. But it is in the U.S.' long-term interest to do so. By now Washington should be well aware that "what sows the seeds of extremism and instability in the long run are corrupt, autocratic governments." The discourse surrounding "Russia in Africa" is more potent than the reality. **But the reality of many Russian actions — violating human rights, undermining good governance, and prolonging conflict — requires a U.S. response. That response, however, should not come at the expense of the values America promotes.** Rather, countering Russia in Africa should be an **opportunity for the United States and its allies** to double down on their own. If the "Russia in Africa" narrative results in positive engagement and rethinking the gaps between rhetoric and practice, then the discourse's potency may not prove such a bad thing. For now, however, the "Russia in Africa" narrative risks creating the wrong response. A Chadian citizen holding a painted, pro-Russia sign on the streets N'Djamena is not a sinister omen of future Russian designs. Rather, it is a justifiable display of anger at both the French and U.S. policies that continue to support authoritarianism in his country. The greatest danger is that "Russia in Africa" has already spun a narrative web which can catch and connect these small, disparate events and serve, like the threat of jihadism and Communism before it, as a new excuse for sacrificing human dignity on the altar of superficial stability.

Public-private collaboration is essential for African space autonomy

Asiyanbola et al 2019 [Oyedamola A. Asiyanbola, Morayo A. Ogunsina, Abraham T. Akinwale, and John B. Odey, Asiyanbola is a Graduate Research Assistant at Skolkovo Institute of Science and Technology, "Toward African Space Autonomy: Developmental Framework and Incorporated Synergies," March 12, 2021, <https://www.liebertpub.com/doi/10.1089/space.2020.0039> & <https://doi.org/10.1089/space.2020.0039>] //neth

What and Why Developmental Framework for Autonomy? Autonomy to a nation is defined as a form of self-governance and self-defining freedom—a concept that African States must choose to adopt to move up the value and power chain in the 21st century. **African space autonomy in a similar context would be a form of growing interdependence between countries in Africa.**

Established space agencies of more advanced countries have been successful in this plight through a powerful, cooperative framework that fosters the existence of public and private space ventures. A good example is the European Union: Through collaboration within member States, it has kept a self-sustaining economy and a very active European Space Agency (ESA).² Africa could also adopt the relational framework of the ESA to achieve autonomy with an active African Union (AU) through a functional African Space Agency (ASA) that allows public and private access to commercial space ventures by adopting some of these frameworks and strategies. Such a framework should offer a perspective that African States can use to visualize better the future they desire by becoming aware of compelling future needs and solutions that the space industry offers. To this end, policymakers should capitalize exhaustively on the outlook that space permits. In this, there is the need for a developed African Space sector to harness the many benefits of space exploration and, by extension, to establish a regime of African Space Autonomy. Allowing for Incorporated Synergies (Public and Private Actors) To have a productive African space sector, cross-collaborative educational strategy within countries in Africa must be developed. Such educational policy will allow cross-border development so Africans can study encompassing issues within its domain for improvement from the status quo, where Africa relies on external knowledge to achieve its aim. Such an institutional framework also has the potential to reduce the heightened rates of brain drain across all sectors, thereby creating means to develop indigenous capacity. Brain drain has led to a loss of intellectual capacity in Africa, and it has crippled industries across several space industry segments, which could have coalesced to form an active Africa Space Industry and a thriving economic front. In a futuristic outlook—"The Africa we want" of the Pan-African Agenda 2063, if Africa becomes an Economic Giant, a space power, it will be because Africans implemented strategic steps to effectuate such an outcome.⁷ African states must be proactive in securing the necessary steps to establishing their space industry while pushing for competitive advantage. The push for a thorough understanding of the many challenges related to sustainable development goals (SDGs) for African emerging economies is also paramount. Such an essential undertaking will reflect on the potential laden on the fertile African continent, to ease synergies and implementation of the public and private space actors' consensus through the ASA.

R&D is necessary – Pan-African space programs won't get off the ground without it

Asiyanbola et al 2019 [Oyedamola A. Asiyanbola, Morayo A. Ogunsina, Abraham T. Akinwale, and John B. Odey, Asiyanbola is a Graduate Research Assistant at Skolkovo Institute of Science and Technology, "Toward African Space Autonomy: Developmental Framework and Incorporated Synergies," March 12, 2021, <https://www.liebertpub.com/doi/10.1089/space.2020.0039> & <https://doi.org/10.1089/space.2020.0039>] //neth

The Need for R&D and Building Indigenous Capacities for Space R&D in space technology is the next vital step in developing indigenous space capability, more so to gain traction in the international scene and ultimately toward achieving autonomy. To achieve indigenous capability in the space industry, African States must invest in R&D by engaging in scientific research and personnel training. Doing so will allow such states to build the fundamental technological backgrounds and, over time, attain technical competence in the design and development space systems. Establishing capability for carrying out theoretical and experimental investigations in space and atmospheric sciences, satellite design, and space systems are some examples of these. From these, other aspects of space industry development, such as manufacturing and launching capabilities, as well as commercialization and space service provision, can quickly be built. An important area that R&D is very much dependent on is in the educational system of a nation. Space science and technology, and other related disciplines such as astrophysics, astronomy, and earth science should be introduced into the curriculum of tertiary institutions, with mandatory research

and internships. This could also help build up the technological readiness of the continent, boosting more research and also enhancing countries in Africa to adopt new technologies and to improve productivity in other sectors of the industries (such as agriculture, ICT, and the health sector). The water management of the continent could experience more positive transformation through this approach. It is needed to provide distributive innovation platforms, which means changing traditional industrial models, which is encouraged to integrate with scientific research institutes, key laboratories, engineering centers, and other units that have technological advantages. They will jointly undertake major projects and be beneficial to the formation of production, learning, and research integration. **The revitalization of a national space agency, or the establishment of one,** if there is none, is a significant step for a nation choosing to gain ground in the space industry. Such an agency should set the path for development and social benefits through the space industry and ultimately toward national development. It should also improve a nation's space portfolio and foster competition. **Having one will allow African States to coordinate and parallelize space R&D into many of its sectors. For one, it can permit private investment, inter-university collaboration among the African States, joint venturing, and foster agreements among these states and international companies.**^{2,15} Another lies in identifying market-oriented missions, promoting good infrastructure and human capabilities, and dispersing government funding to targeted R&D for the successful use of space to benefit the African populace.¹⁵

Soft-left i/I & impacts

Space growth that excludes Africa widens wealth and achievement gaps

Asiyanbola et al 2019 [Oyedamola A. Asiyanbola, Morayo A. Ogunsina, Abraham T. Akinwale, and John B. Odey, Asiyanbola is a Graduate Research Assistant at Skolkovo Institute of Science and Technology, "Toward African Space Autonomy: Developmental Framework and Incorporated Synergies," March 12, 2021, <https://www.liebertpub.com/doi/10.1089/space.2020.0039> & <https://doi.org/10.1089/space.2020.0039>] //neth

Toward Space Exploration and Space Driving Initiative **As spacefaring nations continue to develop their space industries, with combined efforts of the public and private entities, their level of competitive advantage improves by leaving the African countries far behind with regards to economic growth and technology capacity driven by innovation.**^{6,15,16} Spacefaring nations have pushed their prowess (Competitive Advantage) through continued space research.^{15,17} **It can be said that proceeds from space R&D fostered innovation in every other aspect of science and technological fields, especially in the security, satellites, and telecommunication sectors.** African nations need to rethink what truly defines their aim in the growing globally competitive economic market. Based on Michael Porter's stages of competitive advantage, many African countries can be categorized into the factor-driven and investment-driven stages, for example, they are mainly providers of raw materials to other growing economies.^{15,17} To this end, **we have proposed a sequence of developmental phases** seen in Figure 4, which will serve as the action plan toward this agenda. **Phase 1, the first foundational step, would be a political synergy among African state actors.** What we propose is a political synergy within African countries, which are potential African space actors that have ratified some or all the Outer space treaties.^{1,6,15,18} **Phase 2 would require an introspective approach to gather statistics on resources available and support for the division of research focus and personnel training of ASA.** Such research methodology currently proposed is like the infamous concept of "the division of labor" in the macroeconomics term. It would be the prelude to **Phase 3, where each country accepts the challenge of specialization to gain competence in some space capability, not limited to launching, satellite manufacturing, and remote sensing.** **Phase 4 gives an outlook on what the long-term objective of the ASA would be—a culmination of cooperative and strategic efforts taken to build competency in space autonomy in Africa.** The ASA is expected to lead the implementation phase of the 2063 strategy for African Countries to climb the Space Technology Ladder with a view of responsible innovation and sheer political will. The acquired technological know-how (space technological capability) in the African space actor and their agencies of specialized mastery in one or more space industry segments will aid the effectuating our developmental framework objectives. The ASA will truly be a Global Space Actor if the required of strategy implementation is the sole focus in the plan for the African Space Agenda 2063: "Africa we want."⁷

Responsible innovation and governance are key to equitable resource distribution

Asiyanbola et al 2019 [Oyedamola A. Asiyanbola, Morayo A. Ogunsina, Abraham T. Akinwale, and John B. Odey, Asiyanbola is a Graduate Research Assistant at Skolkovo Institute of Science and Technology, "Toward African Space Autonomy: Developmental Framework and Incorporated Synergies," March 12, 2021, <https://www.liebertpub.com/doi/10.1089/space.2020.0039> & <https://doi.org/10.1089/space.2020.0039>] //neth

The Need for Responsible Innovation and Governance in Africa **The path to genuine pan-African autonomy lies in our drive for responsible innovation and creation of distributive technology that meets socioeconomic needs** and breaks ground for the development of all industry segments that are **needed to acquire Space technological capability.** So how do we responsibly govern science and technological innovation? Responsible innovation is defined as a transparent, interactive process by which societal actors and innovators become mutually inclined to be responsive to each other to attain ethical acceptability, sustainability, and societal desirability of the innovation process and its marketable products.¹⁹ Marketable products imply that the business and investment community (private actors) should be involved. Therefore, Africa's need for responsible innovation and governance should be strongly tied to the attainment of peculiar values across all member states to create an environment for a Pan-African driven educational framework.

Applying this to the African space sector means a proper “embedding of scientific and technological advances” within the African States with a focus on their fundamental challenges, which would create a means to oust the inherent primitive technological solutions in African Countries.²⁰ Agreed peculiar values would create a competition profile for member states, where nations could be rewarded based on their policy implementation strategies and results, such that investors and other stakeholders make and maximize social impact across all industry segments, which would consolidate for a robust space program. Inherently, the success of a nation's space sector is a function of the level of improvement across all industry segments. For instance, the satellite production industry is practically nonexistent in an economy without a semiconductor industry. So far, most African states have not provided full social benefits to their citizens due to a myriad of reasons, with the topmost being lack of poor governance and lack of innovative drive. The social issues plaguing most African States need to be solved from a different perspective, and the space sector offers that perspective through many lenses; it can be used as a tool to improve the socioeconomic lives of citizens. Investment in space programs can solve these issues and serve as a catalyst to boost the economic and innovative infrastructure to that of major developed countries such as the United States and China, who benefited tremendously from such investments. If the African States choose to invest in space innovation and development, one significant aspect of its social issue is sure to be tackled: technological backwardness. By utilizing remote sensing and communication, these nations can quickly provide social services to most of its populations, including those at remote locations. These services also have benefits in the areas of agri-business, disaster warnings and management, and online education as a result of fast broadband internet telecommunication services, and telemedicine—all of which, through improvement and consistently, will foster a comprehensive national development. Complementary to responsible innovation is responsible governance in which roles are allotted to all those (the interested African States in this case) involved in the innovation process. Policymakers in Africa must show intense interest in the exploration and exploitation of space resources before these policy gaps can be addressed adequately and inclusively. However, for sustainable national development, states must reposition their economy from being primary consumers and dependent on other nations for high-tech service providers, in this case, for example, the procurement of satellite services. To achieve the desired autonomy, they must first adopt a producer–manufacturer mindset from which national needs can be met and fulfilled and subsequently extended to export. The space enterprises provide opportunities for the African States to move up the value chain, to diversify business exchanges, and to retain highly skilled engineers and other professionals that are necessary for its technological progress. In addition to this, it serves as both the technical and non-technical motivation to pursue national pride, geopolitical relationships, regional cooperation, and healthy foster competition to aid technological growth, which serves as incentives to subscribing African states. Therefore, there is the need for a technological continuum for emerging African countries across all institutions and reduce the brain-drain factor that plagues every African nation.

Western-imposed political barriers hinder the African private sector and contribute to cyclical brain drain

Asiyanbola et al 2019 [Oyedamola A. Asiyanbola, Morayo A. Ogunsina, Abraham T. Akinwale, and John B. Odey, Asiyanbola is a Graduate Research Assistant at Skolkovo Institute of Science and Technology, “Toward African Space Autonomy: Developmental Framework and Incorporated Synergies,” March 12, 2021, <https://www.liebertpub.com/doi/10.1089/space.2020.0039> & <https://doi.org/10.1089/space.2020.0039>] //neth

A true Pan-African Driven Space Autonomy is one that fosters the independent cooperation in space missions among the African States and solidifies Africa's might and space-capability in carrying out peaceful and beneficial space exploration missions. It goes on to imply that each African State exhibits basic autonomy by its indigenous capabilities in its chosen field of space exploration such that it can engage with other States as well as international communities and agencies in pursuit of peaceful exploits and exploration of space resources. This commands a significant influence on the policies that guide these activities. To create bedding for possible space exploration, industry segment success must coalesce in aiding an African space-driven initiative. Although this work creates a clear need to acquire knowledge through African states as space actors, by pulling resources for a collaborative space sector, a division of labor (specialization) has to be created, such that each country focuses on specific industry segments in space. Such a nation will achieve mastery in the sector. Therefore, the combined capacities of these countries will enable autonomy so that the proposed ASA can thrive. Hurdles to achieving autonomy may stem from different areas such as political meddling and

administrative inadequacies, which can limit flexibility (ease of entry) for private actors. Nevertheless, if these States can adopt the strategies mentioned earlier and implement the proposed model instrument, indigenous capacities in Space technology can be achieved. At the center of the next generation of space autonomy integration in Africa is a collaborative effort for space business, a collective drive for a collaborative solution toward a common goal, with the different businesses working closely with the government agencies, building capacity for the future and contributing to the basic needs of the African man. For Africa to develop and become autonomous in the global space community, space business must thrive in Africa, with welcoming hands from each State and incentives to encourage integration and growth in the society. For one, R&D need to be implemented in a fashion that is anticipatory and adaptive, so that as newer technologies are developed, existing policies have enough room to accommodate them, their nuances as well as extend their market benefits and risks. Focused technological continuum through checks and rewards, ranking of nations by Africans, is based on achieved milestones while climbing the technological space ladder. This will create grounds for the proactive space industry and promote competition as a new responsive innovation in Africa, possibly through creating an environment for capitalism to thrive, and new grounds for commensurate competitive advantage. Incubation programs should be launched to attract talents across the African countries without prejudice and involving experienced mentors from the rest of the world to come to Africa and help train the next generation of Africa Space Technological Development. To achieve this space autonomy, African States should be driven by responsible innovation and a desire to improve the lives of its citizens. R&D, such as responsible innovation, is part of the first phase that the African States must complete; they serve as the building blocks for innovation, a core foundation for the establishment of the space industry. The next phase is the creation of a robust framework to absorb or regain African intellectual capacity existing as brain drain to all African nations. There is a need to create capital for purposeful accelerator programs within educational institutions, so synergy can exist between the State-led space institutions and coordinated private entry for a revitalized space economy in Africa. Hence, isolation should be avoided. Nations must strive to achieve technological independence so that a sustainable African Space Autonomy can exist as an Interdependence synergy with the budding Africa Space Sector through the ASA. Africa must be a keen participant while finding relevance in the world of Global (Space) Governance. We are in the era of enabling a Pan-African driven Space Force, "Per Aspera ad Astra."

Space isn't just for show – it's k2 providing internet and communications resources to citizens of multiple African nations

Onyango 2021 [Conrad Onyango, contributor at Quartz, "Africa joins the global space race," August 24, 2021, Updated September 2, 2021, Quartz Africa, <https://qz.com/africa/2051243/africa-joins-global-space-race-to-boost-connectivity-and-security/>]

In July, Nigeria's National Space Research and Development Agency (NASRDA) floated a request for proposal, with a public-private partnership arrangement in mind, to provide up to 90% of its citizens with faster, cheaper, and reliable internet by 2025. South Africa's first private prospective satellite operator MzansiSat has announced plan to offer internet connectivity to all SADC region countries, while other local commercials satellite firms in the continent include Nigeria Communication Satellite and publicly traded Egyptian Satellite Co (Nilesat.) Elon Musk's SpaceX has developed a satellite internet constellation dubbed Starlink, which will target the African market with launches scheduled from late 2021 and early next year. Starlink has already launched 1,500+ satellites elsewhere and are beta testing the service in various African countries. "The Space market has changed dramatically. It's not the same market we had a few years ago. It is changing in response to a requirement for connectivity," says Kimaitha. SES Network recently unveiled O3b mPower, its next generation of satellites, with plans to initially launch 11 high-speed satellites into orbits that will provide global coverage including for Africa. This will add to the existing O3B satellite that serves African customers too. The firm said it is targeting governments for public-private partnerships to expand internet connectivity into remote areas, boost the resilience of mobile network operators and support landlocked countries in efforts to bridge the equality gap, through connectivity. "We have countries that are landlocked that do not have access to undersea cables and have to go through multiple countries to get connectivity. There is still demand for good connectivity in those markets and satellite is an answer," said Kamaitha. Countries in the Sahel region like Chad, Niger, and Mali, she said represent a huge opportunity for satellite

connectivity because they are big and landlocked countries. Kamaitha listed a growing need for enhanced security and Intelligence, Surveillance, Reconnaissance (ISR) as key areas pushing up governments demand for satellite connectivity while a rise in adoption of the Internet of Things—including smart-connected homes—was creating demand on the commercial side.

“The big equation is to explore financing models. Where we have been successful with governments has been where we talk about having things like PPPs, where governments, funding entities or private sector comes in and the solutions can be delivered,” expressed Kamaitha. In Burkina Faso, for example, said Kamaitha, SES was offering e-governance solutions and connectivity between provinces. In Ethiopia it conducted capacity building and mass training of young people on basic knowledge of installing and maintaining different V-sat technologies.

Space in Africa, a media, analytics and consulting firm, projects the space market to exceed \$10 billion in value by 2024 on the back of rising investments.

Econ

Space is poised to contain many economic benefits for Africa

Bailey 2021 [Stephanie Bailey, freelance journalist & IT writer, "Why Africa is sending more satellites into space," October 6, 2021, CNN,

<https://www.cnn.com/2021/09/21/business/african-satellites-spc-intl/index.html>] //neth

Since the continent's first satellite launched more than 20 years ago, 44 have been sent into orbit by 13 African countries, according to consultancy Space in Africa. It says a further 125 are being developed by 23 countries, all expected to launch before 2025. The payoff could be substantial. A 2021 report by the World Economic Forum estimates that data collected from space could unlock \$2 billion a year in benefits for Africa. The report says satellites could address agricultural challenges by measuring crop health, improve water management by monitoring drought, and track tree cover for more sustainable forest management. In a continent where less than a third of the population has access to broadband, more communication satellites could help people connect to the internet.

Addressing Africa's challenges South African startup Astrofica was founded four years ago, providing space consultancy services. It supported the CubeSat program at Cape Peninsula University of Technology, which launched a constellation of maritime satellites for tracking ships along the southern African coast. Astrofica's co-founder and CTO, Khalid Manjoo, says the goal of the startup is to use the space industry to address Africa's challenges — from food security to national security. It hopes to launch its first constellation of satellites by the end of 2022, "that will provide decision makers with critical data sets [in] near real time," according to Manjoo. He hopes the data will be used to monitor crop yield or track the use of fertilizers, as well as help governments with water management. "The satellites that we put up in space, it's cool stuff, but it's not necessarily the end goal; the end goal for Astrofica is to deal with the challenges and problems that we would like to solve," he says. "They cannot be solved using purely terrestrial systems, they need these critical space-based insights." Manjoo says African countries are spending too much money acquiring agricultural data from international providers, which is not timely enough — although the company welcomes collaboration with foreign partners.

According to Manjoo, ride shares — where satellite manufacturers can buy a spot on someone else's rocket — have made getting to space cheaper and more accessible. Astrofica is looking to launch its first satellite on board an American SpaceX rocket, a Russian Soyuz rocket, or a Polar Satellite Launch Vehicle in India. Launching constellations Space in Africa estimates over 283 companies now operate in the continent's space and satellite industry, which it says generated more than \$7.3 billion in revenue in 2019 and predicts will generate over \$10 billion by 2024. Another South African company, Dragonfly Aerospace, provides imaging systems for satellites and is now working on launching its own constellation. "The new space industry has a lot of opportunity because there's a lot of growth," says Bryan Dean, Dragonfly Aerospace's CEO. "You are now able to launch more satellites for the same amount of money than you were in the past, and a system of satellites in orbit is far more powerful than a single satellite because they work together and combine the data." Space entrepreneur Max Polyakov bought the company in April and as part of expansion plans, Dean says Dragonfly Aerospace is near completing a 3,000 square meter satellite manufacturing facility in Stellenbosch, South Africa, with capacity to build up to 48 satellites per year. Dean says one bottleneck for the production of satellites is being able to test how they will behave in the extreme temperatures of space. "In the past this was dominated by government facilities which you could rent," he says. "But with the advent of more commercial operations, many companies are investing in having those facilities in house." The company hopes to launch its first satellite in June next year from the US.

Overcoming roadblocks Minoo Rathnasabapathy, a space research engineer at MIT, says the continent's space industry still has challenges to overcome, most notably a lack of resources. "When you consider the US or Europe, it's really apples and oranges," she says. "In the US we see a lot of private industry and a lot of private funding and we're seeing NASA and ESA [the European Space Agency] be able to tap into that funding. Whereas in Africa, we're just not there yet and that's completely understandable given other priorities of the countries." Astrofica's Manjoo says another hurdle is changing mindsets. "There is still a view across the continent, quite a myopic view, that the investments that you need to justify in space are too high risk and also that money may be better positioned in terms of alleviating tangible issues such as education, poverty, infrastructure upliftment, which decision makers can see," he says. Manjoo adds that government bureaucracy is holding back the African space industry and investment is needed to support local businesses. "Those are huge amounts of investments," he says. "But countries are slowly starting to understand that the investment in space today is actually for the sustainability and prosperity of your country and your region in the years to come."

Economic diversification in Africa is necessary

Usman & Landry 2021 [Zainab Usman, senior fellow and director of the Africa Program at the Carnegie Endowment for International Peace in Washington, D.C., and David Landry, fellow at

the Duke University Sanford School of Public Policy and a visiting professor at Duke Kunshan University, “Economic Diversification in Africa: How and Why It Matters,” April 30, 2021, Carnegie Endowment for International Peace, <https://carnegieendowment.org/2021/04/30/economic-diversification-in-africa-how-and-why-it-matters-pub-84429>] //neth

Traditionally, economic diversification involves transitioning away from dependence on one or a few commodities such as crude oil, minerals, and agriculture production toward a broader range of sources of production, employment, trade, revenues, and expenditures. Among economists, the process that is most closely associated with this policy objective of economic diversification is structural transformation, which is characterized by rising productivity, sustained growth, and broader development. It is structural transformation that facilitates the diversification of sources of production and employment, international trade, revenues, and expenditures through various dimensions. Structural transformation involves the movement of a country’s productive resources from low productivity activities such as primary agriculture to higher productivity activities in the industrial or service sector.¹² It is exemplified by a declining share of agriculture in production and employment, a shift of workers from low to high average productivity sectors, and increases in efficiency and productivity. Economic growth is the quantitative increase in economic output usually measured by an increase in GDP. Growth in output can be driven by rising factor intensity, such as adding more farm hands to work on a given plot of land. It can also be driven by rising productivity, such as an improvement in the capabilities of the farmers working that land through, for example, better techniques and tools. At its most basic level, productivity refers to output per unit of production inputs. Productivity growth is associated with higher efficiency in production—an increase in output without necessarily a commensurate increase in inputs of labor, human capital, natural assets, and physical capital. An increase in productivity is essential to sustained economic growth. The consensus among economists is that total factor productivity accounts for the majority of differences in income generated per worker across countries.¹³ That is, with the same amount of inputs—such as workers, equipment, and land—some countries, sectors, and firms produce more than others.¹⁴ One of the most valuable sources of firm-level productivity growth—which helps countries expand their production possibility frontier and catch up to productivity leaders—is an increase in firm capabilities.¹⁵ Chad Syverson addresses two determinants of firm capabilities: production practices and the firm’s external environment.¹⁶ Across sub-Saharan Africa, labor productivity has lagged behind the United States, which is used as the global efficiency benchmark.¹⁷ The average output per worker in sub-Saharan Africa declined from 11.9 percent in 1960 to 7.7 percent in 2017, whereas for East Asian countries, labor productivity increased from 8.5 percent in 1960 to 28.3 percent in 2014. Similarly, there has been a divergence in labor productivity between sub-Saharan Africa and large emerging market economies like Brazil, China, and India. In sum, economic development is a process of sustained economic growth and structural transformation from low to higher productivity activities. How do these concepts relate to diversification? For many low-income countries, the process of economic development comprises diversification—a transition from subsistence agriculture, natural resources extraction, and other forms of primary production toward value-added manufacturing, services, and other industry. In other words, economic diversification is directly linked to economic development, characterized by rising per capita incomes, reduced poverty levels, and industrial transformation. While several dimensions of economic diversification have significant implications, they generally depend on countries’ structural characteristics. The two most common conceptualizations of the term are GDP diversification—that is, the sectoral contributions to employment and production—and exports diversification in terms of the main goods and services sold to trade partners. But there is an important third conceptualization: fiscal diversification. It involves expanding the sources of government revenues and the targets of public expenditures. The first conceptualization denotes an increase in the number of economic sectors that contribute to an economy’s aggregate employment and output.¹⁸ This usually entails structural transformation, as discussed above—a transition from primary industries toward more technologically advanced sectors, a shift away from informal economic sectors toward formal sectors, and increasing levels of productivity more broadly.¹⁹ In practice, this conceptualization generally captures the relative value added of specific economic sectors as a share of aggregate output, especially industry and services. Peter Schott presents the idea that countries travel across diversification “cones” as they accumulate capital and move up the production value chain.²⁰ As this transition occurs, old cones, such as natural resource exports, should decrease in importance while new cones, such as manufacturing, should gain prominence. The growth in some economic sectors may provide intermediate inputs to the growth of others and thus diversify the sources of employment and output. For instance, several scholars point to how underdeveloped financial markets create frictions that decisively affect output per worker, aggregate and sector-level productivity, and investment ratios. Financial frictions in developing countries have a severe impact on the manufacturing sector. According to Francisco Buera, they result in a 50 percent decline in productivity, higher relative prices of manufactures compared to services, and a 15 percent decline in investment ratios.²¹ Hence, the informal sector, which is characterized by low wages, skills, and productivity, tends to be prevalent in these countries as the main source of output and employment. Overall, a more evenly distributed economic weight across industries—often marked by a decline in agriculture’s

contribution to the economy—denotes a more diversified economy. That said, such figures can be difficult to compile for developing countries, where informal employment remains prevalent. As Figure 1 demonstrates, the informal sector makes up 85.8 percent of total employment in Africa (71.9 percent of agriculture is excluded from the total). Though substantial variations persist between countries in North and sub-Saharan Africa, and also within sub-Saharan Africa itself, African economies as a whole are marked by high levels of informality.

Diversification is key long term econ stability and growth

Usman & Landry 2021 [Zainab Usman, senior fellow and director of the Africa Program at the Carnegie Endowment for International Peace in Washington, D.C., and David Landry, fellow at the Duke University Sanford School of Public Policy and a visiting professor at Duke Kunshan University, “Economic Diversification in Africa: How and Why It Matters,” April 30, 2021, Carnegie Endowment for International Peace, <https://carnegieendowment.org/2021/04/30/economic-diversification-in-africa-how-and-why-it-matters-pub-84429>] //neth

Economic diversification levels also vary significantly with resource endowments. A large volume of literature convincingly demonstrates that resource-rich countries tend to be less diversified economically than their resource-poor counterparts.⁷⁸ More specifically, though mineral- and hydrocarbons-rich countries generally seek to reduce their resource dependence, relatively few succeed due to the enormous difficulties associated with the process. As outlined by Alan Gelb, a central question facing these countries is “why diversify in the first place?”⁷⁹ Economic diversification entails clear and substantial long-term benefits—economic growth and poverty reduction, protection against volatility, and governance improvements, just to name a few. But governments might be reluctant to reduce dependence on those extractive resources industries in which they have a strong national comparative advantage. This might be due to economic constraints, as the transition can be difficult, costly, and replete with resonating fiscal risks, especially in countries afflicted by the Dutch Disease (in other words, uncompetitive economies resulting from overvalued currencies).⁸⁰ Investments aimed at catalyzing the development of nonresource sectors take time, often decades, to yield results. Therefore, domestic political support for diversification policies is needed. The global policy consensus may also impede such measures. As Ha-Joon Chang and Amir Leboui argue, the global policy consensus for resource-rich countries tilts toward fiscal stabilization and revenue management rather than structural transformation and diversification.⁸¹ Figure 11 plots World Bank–reported natural resource rents as a percentage of GDP and the EDI. They distinctly show that, as countries’ dependence on natural resource rents increases, their export diversification levels decrease. This is consistent with what Nour Alsharif, Sambit Bhattacharyya, and Maurizio Intartaglia found—that a notable negative relationship exists between oil dependence and economic diversification.⁸² Figure 12 plots manufacturing value added as a percentage of GDP and the EDI. The data demonstrate a clear positive relationship between the two. In other words, as countries’ manufacturing value added as a share of GDP grows, so does their export diversification. This is unsurprising, given the results presented above and the fact that resource dependence and manufacturing value added are expected to be negatively correlated. Governance is also closely correlated with economic diversification. But while governance is widely accepted to be a key determinant of economic growth,⁸³ it remains underexplored in the economic diversification literature. Figure 13 plots government effectiveness and export diversification. The measure of government effectiveness used is from the World Bank’s Worldwide Governance Indicators and reflects “perceptions of the quality of public services, the quality of the civil service, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.”⁸⁴ The data show a strong positive correlation between government effectiveness and export diversification, both worldwide and among African countries specifically. This phenomenon is hypothesized to take place in various ways, such as through the improvement of governments’ administrative or bureaucratic capabilities, the decreased potential for state capture by actors from specific economic sectors, and the empowerment of new economic interest groups that might demand greater accountability. Favorable institutional conditions are necessary for economic diversification—but not sufficient.⁸⁵ As Alan Gelb’s discussion of Botswana demonstrates, impressive reforms may not lead to diversification due to structural factors such as labor scarcity or lack of market access.⁸⁶ Consequently, only a few resource-rich developing countries have managed to successfully diversify economically. Ian Coxhead identifies only five such cases (Chile, Indonesia, Malaysia, Sri Lanka, and Thailand).⁸⁷