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AFRICA DEFENCE FORUM



INVESTING IN AIR POWER

Countries Act to Improve Security
From the Skies



PLUS

A Conversation With
Maj. Gen. Hendrick Thuthu Rakgantswana,
Botswana's Air Chief

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ON THE COVER:

This cover shows how air power can be used for missions such as transporting troops, responding to natural disasters and medical evacuations.

ALL PHOTOS BY AFP/GETTY IMAGES
AND ATMIS

Investing in air power is never simple. Budgets are tight, and demands come from many directions. Aircraft are costly, hard to maintain and require extensive training to operate. But countries that make smart investments find that it pays off.

Countries with strategic airlift use it to quickly respond to domestic and regional crises. Air forces with intelligence, surveillance and reconnaissance capabilities can pinpoint the location of enemies and target a ground-based or aerial response. Militaries flying light attack aircraft are well suited to the close-air support operations needed to defeat insurgencies.

Countries also are showing that partnerships can lower the costs and expand the benefits of air power.

In the Lake Chad Basin, Nigerian Air Force pilots flying light attack aircraft are decimating Boko Haram camps, helping the Multinational Joint Task Force fight the insurgency. Kenyan pilots flew South Sudanese and Burundian troops to the East African Community's mission in the eastern Democratic Republic of the Congo. Angolan pilots under the Southern African Development Community transported equipment and troops from as far away as Lesotho to help bring peace to northern Mozambique.

The success of these partnerships is prompting efforts to expand them. The African Union and some of the continent's regional economic communities are studying ways that air transport sharing mechanisms could make airlift available wherever it is needed. Other proposals call for nations to pool resources to buy aircraft that can be jointly owned, operated and deployed when needed.

Regional efforts can go even further with the establishment of academies to train pilots and logistics personnel. Increased intelligence sharing can help nations develop a better picture of threats that cross borders. Continental efforts such as the African Air Chiefs Symposium allow leaders to exchange ideas and develop solutions to continental challenges.

No military alone has the means to respond to the complex security challenges on the continent. By partnering to use air power effectively and efficiently, air forces can have a greater impact and restore security to some of the continent's most troubled regions.

U.S. Africa Command Staff

Kenya Air Force F-5 fighter jets fly during a Jamhuri Day celebration.

AFP/GETTY IMAGES



Air Power

Volume 16, Quarter 3

U.S. AFRICA COMMAND



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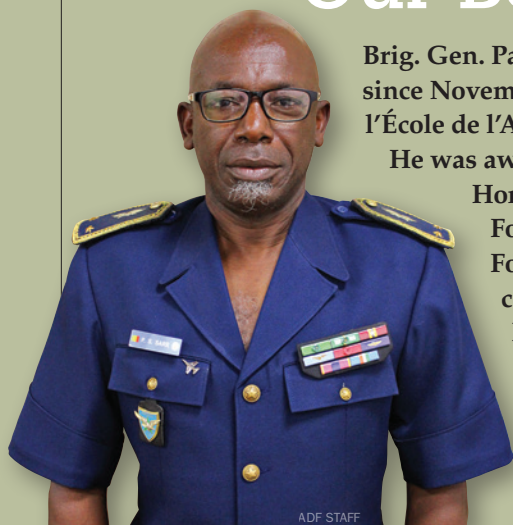
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ADF is a professional military magazine published quarterly by U.S. Africa Command to provide an international forum for African military personnel. The opinions expressed in this magazine do not necessarily represent the policies or points of view of either this command or any other U.S. government agency. Select articles are written by ADF staff, with credit for other content noted as needed. The secretary of defense has determined that publication of this magazine is necessary for conducting public business as required of the Department of Defense by law.

‘The Threat Transcends Our Borders’



Brig. Gen. Papa Souleymane Sarr has been chief of staff of the Senegalese Air Force since November 2020. He entered the Air Force in 1985, attending Le Cours Spécial de l'École de l'Air in France, where he earned his pilot rating and a degree in engineering. He was awarded the United Nations Medal and the French Aeronautical Medal of Honor for his service with the U.N. He has commanded at all levels of the Air Force, including head of the Operational Wing, Air Force Intelligence, Air Force Instruction and commandant of the Air Force Academy. He served as co-host of the 2023 African Air Chiefs Symposium in Dakar, Senegal, from February 28 through March 3. He spoke at the opening ceremony, and his remarks have been translated from the original French and edited for space and clarity.



For the past 15 years, several regions of the African continent have seen the move-

ments of terrorists, including Jama'at Nasr al-Islam wal Muslimin, the Islamic State in the Greater Sahara, Boko Haram in the Lake Chad region, al-Shabaab in the Horn of Africa and the Islamic State group in the Maghreb.

These groups have caused several thousand deaths and several million people to be displaced, thus leading to unprecedented humanitarian devastation. One has to acknowledge that these small groups are attempting to control vast territories located between several countries.

Furthermore, the existence of vast areas that are difficult to control, combined with porous borders and the surge of all kinds of trafficking, requires that we adopt a synergistic and collective approach.

In the face of this particularly worrisome situation, it is urgent that we, as defense officials, take advantage of the opportunity offered by this symposium to share our experiences and exchange various paths toward solutions in order to contain these threats that impact the security of our nations and represent an obstacle to development.

At the end of this symposium, we will need to derive some shared solution paths



Brig. Gen. Papa Souleymane Sarr, left, commander of the Senegalese Air Force, and Gen. James B. Hecker, commander of U.S. Air Forces in Europe-U.S. Air Forces Africa, preside over the closing ceremony of the African Air Chiefs Symposium in Dakar, Senegal, on March 3, 2023. ADF STAFF

that our air forces may consider in order to strengthen their roles in the inclusion of transnational threats with increasingly sophisticated modes of action.

Thus, our air forces have the duty to strengthen their operational capabilities at all levels for the purpose of better and more efficiently addressing security challenges by means of an attitude of permanent vigilance and improved cooperation among ourselves.

The threat transcends our borders, our beliefs and our ideologies. This is why the armed forces of the African countries, and above all their air forces, are being increasingly called to action.

Before reaching these objectives, it may be necessary to implement various acquisition projects for tactical

multimodal carriers to be used in a large number of air-land missions, thus enabling us to have appropriate aerial coverage of our territories.

The empowerment and modernization of our African air forces, although crucial, are only one step toward eliminating these transnational threats. It is above all essential to work toward the development of a more collaborative approach to address the common security challenges by sharing our resources.

Meetings such as this one are an excellent opportunity for, on one hand, sharing our difficulties and perspectives, and, on the other, strengthening our cooperation toward the suppression of our common enemies, who know no physical borders.

MOZAMBIQUE LEGALIZES LOCAL MILITIAS TO FIGHT INSURGENTS

VOICE OF AMERICA



Mozambican President Filipe Nyusi speaks to members of the local defense group known as the Forca Local in Mueda, Cabo Delgado. He praised their efforts and pledged continued governmental support.

OFFICE OF THE PRESIDENT, MOZAMBIQUE

As the fight against violent extremists in Mozambique's Cabo Delgado province continues with a regional military force, the country has authorized the creation of local militias to help.

The government in Maputo approved the decree on April 5, 2023, after having secured parliamentary approval for the move in November 2022. The Defense Ministry admitted that the Mozambican Army alone could not deal with the militants.

Mozambique has been fighting militants linked to the Islamic State group in Cabo Delgado since 2017.

The local self-defense militias already help the Mozambican armed forces and military contingents from Rwanda and some Southern African Development Community countries in the fight in oil-rich Cabo Delgado.

Cabinet spokesman Filimao Suazi said the local militia will be

formalized to strengthen the effort to counter and contain the spread of militant incursions, and protect community settlements and infrastructure. He added that the decree will allow for better structure, organization and logistical support for local self-defense militias.

Suazi said the decree establishes the local force and the respective statute, and defines the concept of the local force, its activation and deactivation, composition, forms of acquisition, and rights and duties.

This force mostly is composed of ex-combatants and civilians who, since 2020, have supported the fight in Cabo Delgado.

In five years, the conflict in Cabo Delgado has caused close to 5,000 deaths, according to the Armed Conflict Location & Event Data Project. It also has displaced more than 1 million people, according to the United Nations High Commissioner for Refugees.

African Chiefs of Defense Share Lessons, Build Bonds

ADF STAFF

The annual African Chiefs of Defense (CHoD) Conference 2023 offered a rare opportunity for military leaders to learn from fellow commanders on the front lines of some of the continent's toughest battles.

"In the militaries and the assignments that we all have, learning is a responsibility of command," Botswana's Commander of the Defence Force Lt. Gen. Placid Segokgo told attendees. "It should go vertically from the bottom up and from the top down. It should go horizontally, across to influence at a peer level."

Senior military leaders from 43 African countries convened at the 2023 CHoD Conference in Rome from February 27 to March 2 to network, build partnerships and help find African solutions to African security challenges.

Attendees listened as Brig. Gen. Scech Aues Mao'Mahad, Somalia's defense attaché in Rome, shared hard-earned knowledge from the violence that has ravaged his country.

"The real issue is that we don't listen to the people," he said. "We don't deliver services. We don't deliver food and water, electricity. The people prefer terrorists to the government."

The theme of the event was "How Resources & Requirements Affect our Mutual Reality and Reputation." Five panel discussions and a keynote speaker addressed instability, protecting resources, maximizing technology, and crisis preparation and response along with other challenges.

Dozens of military leaders took the opportunity to create and enhance relationships, grow partnerships and discuss their shared visions for the future of multinational coordination, operations and interoperability in Africa.

Stability was a key element that wove throughout the conference, with discussions touching on root causes, indicators and directions of instability.

In just a few minutes, Mao'Mahad told stories and shared the lessons he had learned in Somalia. Addressing insecurity is just one way to lift a country.

"We have to go back to the people," he said. "We have to go into a village, try to give water to them, try to give medicine to them, try to give schools, so that the government is present and strong. If there is less corruption, more accountability and transparency, that, I think, will be the way to start to fight against terrorism."

Malawi Battles Dual Threats of Cholera, Cyclone

ADF STAFF

As Malawi was confronting what would end up being the deadliest cholera outbreak in its history, another menace waited offshore: Cyclone Freddy.

The storm came aground in Madagascar and Mozambique in late February 2023. After gaining strength over the Mozambique Channel, it hit land again, affecting Malawi in March. Its rising waters and high winds made it one of the deadliest storms to ravage the country in the past two decades, Reuters reported.

By mid-April, more than 1,000 had died because of the storm, according to President Lazarus Chakwera. It affected more than 2 million people and displaced more than 500,000, Reuters reported.

It also exacerbated the protracted response to the cholera outbreak, which began in March 2022. Gavi, the Vaccine Alliance reported on April 26, 2023, that Malawi had logged 58,063 cases and 1,741 deaths.

In response, the United States Agency for International Development has provided \$2.5 million to UNICEF to bolster the cholera fight in Malawi. UNICEF will work with Malawi's ministries of Health, and Water and Sanitation to provide hygiene services in schools and surrounding communities. The effort is expected to help at least 300,000 people, more than 120,000 of whom are children, UNICEF said.

Work will include upgrading water and sanitation facilities in health centers and schools. It also will fund cholera-prevention materials and messaging. The effort is expected



People cross floodwaters caused by Cyclone Freddy in Muloza, Malawi, on the border with Mozambique. REUTERS

to help students return to school in Blantyre by providing cleaning supplies, promoting hygiene, and monitoring and treating water.

Cholera is an acute diarrheal infection caused by contaminated food or water. It can kill through dehydration if left untreated. Flooding such as that from Cyclone Freddy can spread waterborne diseases.

UNICEF's Malawi representative, Dr. Gianfranco Rotigliano, said the country must be prepared for future outbreaks. "With over 14,000 children affected and 230 young lives lost, the outbreak presents a significant threat to the health and survival of children across Malawi," he said. "While we work with our partners to address their immediate needs, we must prioritize investing in and strengthening access to quality health care and clean water and sanitation facilities in vulnerable communities."



Lt. Gen. Kayanja Muhanga, land forces commander of the Uganda Peoples' Defence Forces, chats during the African Chiefs of Defense Conference in Rome.

STAFF SGT. JEREMIAH MEANEY/U.S. AFRICA COMMAND



STRENGTH IN THE SKIES

ADF ILLUSTRATION

African Countries Are Investing in Air Power, Embracing Cooperation

ADF STAFF

For most of post-independence history, air forces in Africa were not a priority. Expensive and difficult to maintain, air power was seen as a luxury not useful to the realities and unique threats on the continent. With tight budgets and command structures dominated by ground forces, air forces make up less than 10% of uniformed personnel in many countries.

That is changing. As countries face the threat of violent extremist organizations, light attack aircraft are proving to be a force multiplier that gives the military the upper hand. In battles against insurgent groups that thrive in remote areas, intelligence, surveillance and reconnaissance capabilities are essential to launching targeted strikes. For countries seeking to move personnel, equipment or relief supplies to crisis regions, heavy airlift is the best solution.

Between 2022 and 2023, Africa was one of only two regions in the world that saw a full percentage increase in its continental fleet size, adding 41 military aircraft. Large, well-established air forces increased their transport fleets. Algeria added two LM-100J transport aircraft, Tunisia ordered eight Beechcraft T-6C turboprop trainers, and Angola ordered three Airbus Defence and Space C295s for maritime surveillance and transport. Meanwhile, the Moroccan Air Force is expected to receive 25 F-16 Block 72 fighter aircraft between 2025 and 2027.

The reason for the investment is on-the-ground success. Maj. Gen. Abdul Khalifa Ibrahim, then-force commander of the Multinational Joint Task Force in the Lake Chad region, summed it up when he said air power is “central” to his troops’ ability to defeat violent extremist groups.

“In modern warfare, one of the dominant themes is the use of air power because it gives an additional reach; it allows delivery in places that ground troops can’t easily reach,” Ibrahim told ADF. “Air power has been a force multiplier of immense proportion.”

Active Air Fleet in African Countries

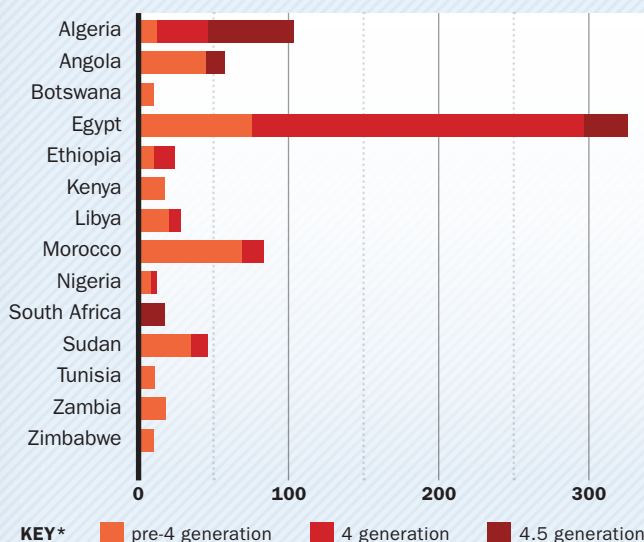
Combat aircraft	959
Combat helicopter	1,631
Special mission	59
Tanker	7
Training aircraft/helicopters	1,035
Transport	427
Total	4,118

2022 to 2023 Year-Over-Year Change

+1%

Source: Flight International 2023 World Air Forces

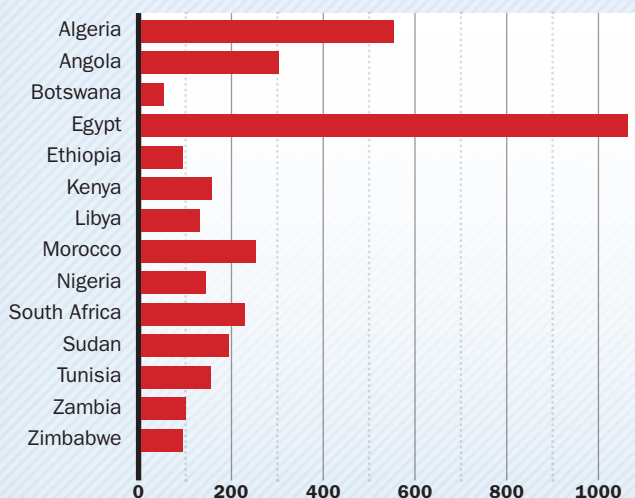
Fighter Jets of African Air Forces



*Fourth-generation fighter jets have been in service from the early 1980s to the present day. 4.5-generation fighters have been upgraded with advanced radar, data-link, avionics and other tools.

Sources: AeroTime, WDMA, FlightGlobal 2021

African Air Forces Total Aircraft



Sources: AeroTime, WDMA, FlightGlobal 2021

ISR Offers Eyes in the Sky

As air forces combat insurgencies that operate in some of the toughest and most isolated environments on the planet, the ability to track them from the air and plan a speedy response is crucial. The same principle applies to efforts to fight drug trafficking, piracy, illegal fishing and wildlife poaching.

Intelligence, surveillance and reconnaissance (ISR) platforms are not simply aircraft, they are systems through which information is collected, processed and put in the hands of decision-makers. Therefore, the ability to collect information from the sky is only as valuable as the ability to “process, exploit and disseminate” it.

Most ISR aircraft are equipped with a high-definition camera and video recorder integrated with a mapping system. Aircraft with infrared capability can track vehicles or people through the night. Common models include the Beechcraft 350ER King Air, Cessna 208 Caravan and Diamond DA42. South Africa’s Paramount Group produced the two-person Mwari with hybrid ISR and close-air support capabilities. It bills itself as a rugged aircraft designed for austere environments that requires minimal logistical support.

There is a wide range of options. Some countries are



The Mwari can be used for intelligence, surveillance and reconnaissance (ISR) or close-air support. Countries facing asymmetric threats, trafficking and poaching plan to improve ISR capabilities. PARAMOUNT GROUP

buying refurbished planes that have been decommissioned by other air forces. Others are contracting with companies to conduct surveillance. Still others have found unmanned aerial vehicles to be a cost-effective solution.

“For countries with limited resources and finances for this role, there is no need for an expensive ‘all singing-all dancing system,’” according to Times Aerospace. “Today, there are several airborne non-traditional ISR (NTISR) options out there, which are relatively cheap, and can do the job.”

Light and Effective

African air forces are moving away from costly fighter jets that provide overwhelming firepower but are most useful for interstate conflict. Instead, countries are investing in small fixed- or rotary-wing aircraft equipped with attack capability in the form of guns or air-to-ground missiles.

These aircraft are cheaper, easier to maintain and better adapted to the threat of violent extremist organizations. One example of this is the Aero L-39, which is in service as a trainer or with ground-attack capability in 10 African countries, according to Times Aerospace. Other countries have opted for turboprop aircraft, with the A-29 Super Tucano among the most popular.

Light attack aircraft are no longer viewed as a consolation prize to a costly fighter jet. Many countries now see them as a better tool for asymmetric warfare.

“Though many African air forces have prioritized the procurement of fast-jet fighters, some have found themselves, either as a result of smart procurement practices, or because of historical accident or budgetary need, to have far more useful equipment,” according to Times Aerospace.

The countries that have developed ISR capabilities along with a fleet of light attack aircraft have shown the best results.



The A-29 Super Tucano is a turboprop plane that has proved effective in counterinsurgency operations.

“African air forces require easy to maintain and operate light attack aircraft with acceptable flight hour costs,” wrote Stephen Burgess in “Africa Airpower: A Concept” published in Revista da UNIFA. “If an attack capability can be paired with an ISR capability on a common platform, the utility increases even further. This pairing of ISR and strike functions on an airframe significantly accelerates the kill chain, allowing an aircraft to target a [violent extremist organization] almost immediately after finding it.”

Strategic Lift Is a Shared Responsibility

A loadmaster and an aerial port operations specialist guide cargo onto a C-130 Hercules transport plane at Camp Simba, Kenya.

SENIOR AIRMAN DWANE YOUNG/U.S. AIR FORCE

Africa is one-fifth of the world's landmass, and many of its nations face challenges of vast, lightly inhabited territory with underdeveloped road systems. In emergencies, it is essential to move personnel or supplies quickly to the place they're needed most. Strategic airlift is needed for these peacekeeping efforts and humanitarian responses.

But the continent suffers from a shortfall in strategic airlift. Only a handful of countries have the assets necessary to transport troop contingents and heavy equipment over long distances in short periods, according to an analysis published by the Africa Center for Strategic Studies.

The largest platforms, with a maximum payload of about 75,000 kilograms, can transport enough equipment into an area of operations to support a full brigade. Medium-sized airlift platforms with a maximum payload of about 18,000 to 36,000 kilograms, are better suited to move equipment to support one to two battalions on short notice. These planes are costly to acquire, maintain and to train those who will operate them.

Since capabilities are unevenly distributed on the continent, experts believe there is a need to coordinate efforts. This could mean sharing resources or pooling funding to increase purchase power. It begins with transparency and documenting capabilities country by country to determine where strengths and shortfalls exist.



A Joint Approach

Regions around the world have shown that collaborating and sharing air resources in areas of mutual interest leads to success. Africa, like many parts of the world, faces challenges that impede cooperation. This includes a lack of equipment interoperability, training and force structure differences, language barriers, and mistrust.

Stephen Burgess, in "Africa Airpower: A Concept" published in Revista da UNIFA, writes that a good starting point for cooperation is the creation of regional training centers. Led by regional economic communities, countries could create pilot training programs and offer slots to each country in the region. There could be similar training centers for maintenance and other specialties. This builds a shared bond and a community of experts among Airmen in the region.

As air force partnerships develop, there could be opportunities for shared acquisition

Nigerian Air Vice Marshal Charles Ohwo, left, greets Liberian Chief of Staff of the Armed Forces Maj. Gen. Prince Charles Johnson III to discuss Nigerian support of Liberia developing its air power capacity.

NIGERIAN AIR FORCE

of new aircraft, standardizing equipment, joint training, and shared intelligence, surveillance and reconnaissance data relating to common threats.

There is some movement in this direction. The African Union is creating an Africa Air Mobility Command Center, which would be a multinational airlift unit that shares continental resources to move personnel and equipment. Sharing strategic airlift will require common doctrine and procedures that could be a springboard to additional cooperation.

"We need to come up with mechanisms of optimizing the use of the very limited resources available to us," said Botswana Defence Force Brig. Collen Mastercee Maruping, acting deputy air arm commander.



COOPERATION

Takes Flight at Symposium

**Air Force Commanders
From Across the
Continent Discuss
Shared Challenges,
Resources**

ADF STAFF

ADF ILLUSTRATION



Attendees at the African Air Chiefs Symposium 2023 watch a video greeting from Gen. Charles Q. Brown, U.S. Air Force chief of staff, during the opening ceremony on February 28, 2023, in Dakar, Senegal.

TECH. SGT. PETER THOMPSON/U.S. AIR FORCE

As air chiefs unpacked their bags and got back to work after returning from a continental symposium in Senegal, nature brutally underscored some of the themes and challenges they had discussed there.

Tropical Cyclone Freddy, after traveling more than 8,000 kilometers in 34 days, struck Mozambique's northern Zambezia province on March 11, 2023, eight days after the end of the African Air Chiefs Symposium (AACS) in Dakar. It was the enormous storm's second landfall.

Powerful winds, rain and storm surge caused damage and destruction in Malawi, Mozambique, southeastern Zambia and northeastern Zimbabwe. The record-breaking cyclone first hit land in Madagascar on February 21, a week before the start of the AACS. After dispensing heavy rain and flooding to Mozambique and Zimbabwe, it looped into the Mozambique Channel, where warm water reenergized it before it again hit Madagascar and moved back toward Mozambique. As of mid-March, more than 500 people had died, and Malawi saw gains made against a stubborn ongoing cholera outbreak sink in Freddy's deluge.

In some countries, air chiefs returned to a landscape awash in floodwaters, debris and death. Discussions of strategic airlift and humanitarian relief and disaster



ADF STAFF

“The vision of the African air chiefs is to come together and build a strong African relationship in terms of safety, peace and security. So, this is a special forum.”

~ Maj. Gen. Ian Macleod Chirwa,
Malawi Air Force commander

response were fresh in their minds.

Malawi's Air Force just came into existence more than two years ago, transitioning from a smaller air wing, Maj. Gen. Ian Macleod Chirwa, air force commander, told ADF in Dakar. In mid-March, Malawi called on neighboring Zambia to lend helicopters to the ongoing rescue mission, exhibiting the collaborative spirit discussed during the symposium.

“We requested our Zambian counterparts to assist us with the rescue operation,” Malawian Minister of Defence Harry Mkandawire told Nyasa Times, a Malawian news website, on March 15. “We need to work together in this mission, especially that we need equipment such as helicopters to assist us in reaching out to the people in hard to reach areas.”

Cyclone Freddy wasn't the first such storm to hit southeastern Africa, and it won't be the last. Cyclone Idai wreaked havoc on the region in March 2019, killing more than 1,500 people. For that reason, some of the cooperation discussed among the air chiefs is urgent.

Air force chiefs and other personnel from nearly 40 countries met in

Dakar from February 28 through March 3 for the 12th iteration of the AACS to talk about the challenges shared by many continental air forces.

Brig. Gen. Mohamud Sheikh Ali Mohamed, Somali Air Force commander, center, signs the Association of African Air Forces Charter during the African Air Chiefs Symposium on February 28, 2023, in Dakar, Senegal.

STAFF SGT. MADELEINE E. JINKS/U.S. AIR FORCE



Air Chiefs Hear Pitch to Add Aviation to Maritime Architecture

ADF STAFF

Ten years after the signing of the Yaoundé Code of Conduct, West African nations have seen meaningful gains in maritime security.

Information is flowing freely from coordination centers in each of the five cooperation zones and into regional centers in Pointe Noire, Republic of the Congo; Abidjan, Côte d'Ivoire; and to the Interregional Coordination Centre in Yaoundé, Cameroon.

Technology put in place in 2020 allows the sharing of logs, photos and recordings, and helps users aggregate surveillance data to identify suspicious vessels. The results are significant.

Piracy in the Gulf of Guinea has declined from 81 incidents reported in 2020 to only 34 incidents in 2021. In the first nine months of 2022, there were only 13 reported incidents, according to the Organized Crime and Corruption Reporting Project.

The only thing missing from the Yaoundé Architecture, says air and maritime consultant Phillip Heyl, is an air component.

"Now one thing we didn't do 10 years ago, and the reason I'm here, is because we didn't set up an air component to the Yaoundé Code of Conduct," Heyl told officials at the African Air Chiefs Symposium (AACS) in Dakar, Senegal. The Economic Community of West African States (ECOWAS), he said, wants to add an air component to its Integrated Maritime Strategy.

"As all of you know, you can't catch bad guys on the water without aircraft. It's essential."

Heyl, of The Heyl Group, is contracted to the U.S. Air Force and is working with ECOWAS on the air concept. He said his pitch was the first given to African air chiefs on the idea. He said some air forces, such as Ghana, Nigeria and Senegal, contribute to offshore patrols, but not at a level needed to fully control the maritime space. He added that international partners would be willing to fund such air patrols.

Integrating air patrols with vessel patrols would add a crucial

dimension to the code's maritime architecture and help secure the entire region's blue economy, which has grown in recent years to include oil and natural gas discoveries. That, Heyl told ADF, can help generate income to address a wide range of other needs, such as education and alleviating poverty. "But if you don't govern it, everyone takes it."

The Nigerian Maritime Administration and Safety Agency has made recent strides toward securing its maritime domain through its \$195 million Integrated National Security and Waterways Protection Infrastructure, known as the Deep Blue Project. But Nigeria bought its own land, sea and air assets, he said.

"What we are talking about doing here is taking existing assets, an existing air force, that doesn't really have an offshore ISR (intelligence, surveillance and reconnaissance) mission, and asking them to contribute that," Heyl told ADF. "We're not buying new airplanes; we're just using what we have. Because one of the strategic initiatives is better coordination of your own agencies. It doesn't cost you any more; you pay them anyway. So why not get them all to work together to do something?"

Brig. Gen. Papa Souleymane Sarr, Senegal's air chief of staff and co-host of the AACS, told ADF that he is "very, very supportive" of the idea.

"Senegal is among those countries contributing in that we've put our assets to do maritime surveillance," Sarr said. "I'm supportive of what they are doing in there, and of course we'll add our voice to others to make it happen, and I think we will be able to achieve it, especially when [Heyl's] saying there's some possible funding African nations can get from donors or wherever. I think this is ground we can dig in to find solutions."

Heyl told the air chiefs they should coordinate with ECOWAS and the Economic Community of Central African States to get air force personnel working in the various zones' monitoring centers.

"That maritime security, combined with the air component, will mean economic development," he said. "That's the bottom line."

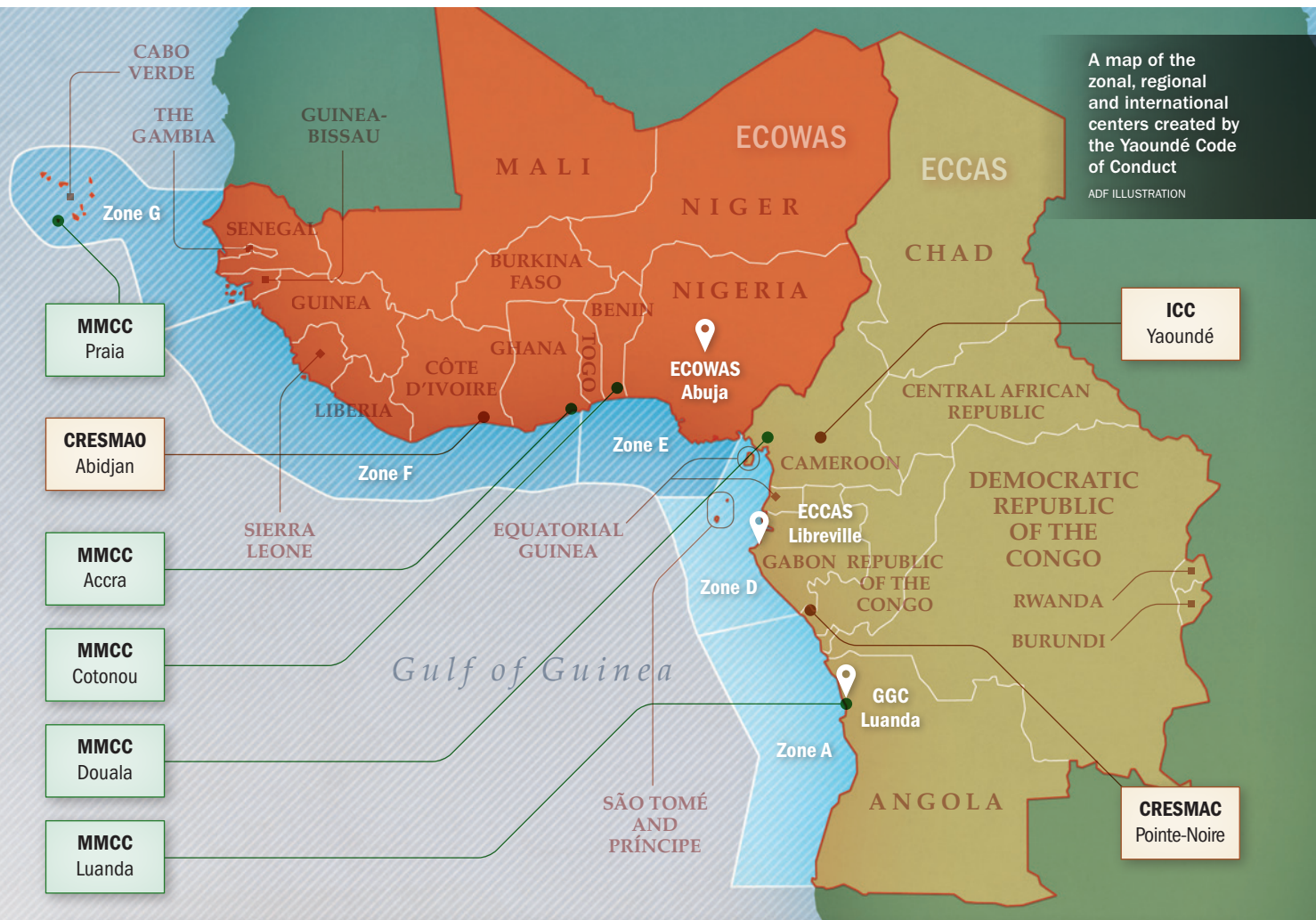
“Our objective is, in part, to reaffirm the links among the air forces and at the same time to discuss subjects that are important for our cooperation.”

~ Brig. Gen. Papa Souleymane Sarr, Senegal's air chief of staff

“Our objective is, in part, to reaffirm the links among the air forces and at the same time to discuss subjects that are important for our cooperation,” Brig. Gen. Papa Souleymane Sarr, Senegal's air chief of staff, told local reporters in French during a news conference at the four-day event.

Sarr served as co-host of the AACS with Gen. James B. Hecker, commander of U.S. Air Forces in Europe-Air Forces Africa. The symposium theme was “African Air Forces in the Fight Against Transnational Threats.”

The symposium was held under the auspices of the Association of African Air Forces (AAAF), an air power collaborative established in 2015 when Côte d'Ivoire, Mauritania and Senegal joined the U.S. in signing the AAAF Charter. At the 2023 symposium, Somalia became the 29th African nation to join the association when Brig. Gen. Mohamud Sheikh Ali Mohamed, Somali Air Force commander, signed the group charter during the opening ceremony.



Strategy and Governance

- **ECCAS:** Economic Community of Central African States
- **GGC:** Gulf of Guinea Commission
- **ECOWAS:** Economic Community of West African States

Implementation of Governance

- **CRESMAC:** Regional Maritime Security Centre for Central Africa
- **ICC:** Interregional Coordination Centre
- **CRESMAO:** Regional Maritime Security Centre for West Africa

Operational Conduct

- **MMCC:** Multinational Maritime Coordination Centre



“The symposium enhances our relationships. We share our air force value among presentations and among bilateral meetings.”

*—Brig. Gen. Hermalas Ndashinze,
chief of the Burundi Air Force*

Transnational threats continue to plague much of the continent, from weapons smuggling out of Libya to violent extremist organizations terrorizing the Sahel and northern Mozambique. Some West African coastal nations find themselves using air assets to help fight maritime crimes of all kinds. The fact that the 2022 AACS focused on strategic airlift makes clear that the challenges facing air chiefs are broad and persistent.

Sarr cited the threat of violent extremism that has for more than a decade roiled Mali’s north and spilled over into neighboring Sahelian states such as Burkina Faso and Niger. In more recent years, that threat has made its way closer to coastal nations such as Benin, Côte d’Ivoire, Ghana and Senegal.

“The threats now cross borders,” Sarr told local reporters. “We have a common enemy who is trying to wipe out all the efforts of our countries. So, we all have to work hand in hand to succeed in pushing back this enemy.”

Tunisian citizens disembark from a military transport plane in Tunis after being evacuated from Sudan in April 2023. Aerial transport capability is a challenge for many African nations. AFF/GETTY IMAGES

Although Sarr said Senegal can maintain its own security, he said cooperation among nations will be essential in meeting the threat, adding that Senegal will extend “an outstretched hand to all our friends.”

Famines and weather-related disasters, similar to transnational criminals and violent extremist organizations, do not stop at borders.

They always will require coordinated and cooperative responses. Such cooperation was on the minds of AACS attendees and resulted in one of two major votes taken by air chiefs during the symposium.

Pooling Resources

African officials have been considering a shared repository of air assets that could provide timely, coordinated responses to humanitarian disasters of all kinds. Liaison officers spent the year leading up to the symposium discussing the African Air Mobility Wing, and air chiefs voted to approve the concept this year. From there, the AAAF will approve the idea, and air chiefs will encourage their national defense ministers to bring it to the African Union for its approval.

Qláyanjú Andrew Pópóqlá, AAAF Permanent Secretariat director, said the mobility wing would be similar to the Strategic Airlift Capability Heavy Airlift



Wing in Pápa, Hungary, and NATO's AWACS Wing in Geilenkirchen, Germany.

The Heavy Airlift Wing in Hungary has 12 member nations and is the first of its kind aimed at “maximizing military strategic airlift capability through the sharing of resources and pooling of capacity,” according to its website. It began in 2008 and received its first air asset, a Globemaster C-17 transport plane, in July 2009. Two more were delivered three months later. Member nations include the United States and 11 from Europe.

The wing has flown missions to Afghanistan, the Central African Republic, Haiti, Iraq and Libya, to name a few. In 2013, it supported the Economic Community of West African States in Mali. A multinational staff of 150 operate the fleet of three C-17s. As of early April 2023, the wing had flown 3,200 missions, moved 98,000 tons of cargo and logged 36,000 flight hours.

Sarr told ADF that the intent is to have an air wing that will have its own assets and be run by Africans. It will be established in one or two countries, and then various nations will contribute personnel and spare parts. It would handle maintenance and be available for humanitarian aid and disaster response and other types of strategic airlift.

“It’s going to be like a wing we have in our air forces, but it’s going to be a multinational wing in the sense that it’s going to be run by different air forces,” Sarr said. “So, we’ll agree on who’s going to do what. And this wing will be for all African nations, like if you have a disaster, we have to [for example], give a lift to one specific contingent in a mission, so we’re going to do such a mission this way.”

In another vote, air chiefs agreed to share costs associated with future AACs events so that no one country bears the full weight of funding the symposium.

The Value of Gathering

During the conference, air chiefs or their designates met for presentations on humanitarian action and disaster relief; intelligence, surveillance and reconnaissance; women, peace and security; and other subjects. The symposium provided time for bilateral meetings between air chiefs so they could discuss more specific issues one on one.

The symposium also included a forum for senior enlisted officers and cultural performances to foster camaraderie among those attending.

Air force leaders said they found value in coming together to share concerns and challenges.

“The symposium enhances our relationships,” said

Brig. Gen. Hermalas Ndashinze, chief of the Burundi Air Force. “We share our air force value among presentations and among bilateral meetings.” He said if air chiefs see something working elsewhere, they can try to apply that best practice to their own force.

Chirwa, Malawi’s air force commander, agreed. “This conference has got so many advantages,” he said. “Malawi as a country values safety, security and peace. So, the vision of the African air chiefs is to come together and build a strong African relationship in terms of safety, peace and security. So, this is a special forum to contribute as a Malawian, as an air force, to contribute toward this important partnership with so many other countries.”



A Royal Moroccan Air Force Canadair plane douses a wildfire in the Chefchaouen region in 2021. Air chiefs discussed the African Air Mobility wing, which would provide shared assets for a variety of crises.

AFP/GETTY IMAGES

Sarr said the symposium helps build relationships that can pay dividends later. “When you get together, when you get to know each other, it’s making it very easy if something happens,” he told ADF. “Let’s say if there is a disaster in a country, well, the air force chief will be able to count on his counterparts. He’s going to just take his phone and call them, and they’ll be helping. That is what is the first important output we have from these symposiums, these gatherings.”

African nations participating in the symposium were Algeria, Angola, Benin, Botswana, Burundi, Cameroon, the Central African Republic, Chad, Côte d’Ivoire, the Democratic Republic of the Congo, Egypt, Equatorial Guinea, Eswatini, Gabon, Ghana, Guinea-Bissau, Kenya, Lesotho, Libya, Madagascar, Malawi, Mauritania, Morocco, Mozambique, Niger, Nigeria, the Republic of the Congo, Rwanda, Senegal, Sierra Leone, Somalia, Tanzania, Togo, Tunisia, Uganda and Zambia.

The next AACs is planned for early 2024 and will take place in Tunisia. Its theme will center on building next-generation capabilities for Africa. □

‘WE KNOW THE IMPORTANCE OF HAVING SECURE SKIES’



A Botswana Defence Force C-130 Hercules transport plane waits at Sir Seretse Khama International Airport in Gaborone. REUTERS



*Maj. Gen. Hendrick
Thuthu Rakgantswana
of Botswana Discusses
Obstacles to Strategic
Airlift, Maintenance
and Technology*



Maj. Gen. Hendrick Thuthu Rakgantswana became chief of Botswana's Air Arm Command in 2021 after serving in the Air Force since 1986. Rakgantswana has served as squadron commander of the Fixed-Wing Air Mobility Squadron and has piloted the presidential jet. He also has been Air Force director of operations and base commander at Thebeophatshwa Air Base, the Botswana Defence Force's main air base, about 100 kilometers outside the capital, Gaborone. Rakgantswana spoke with ADF on February 28, 2023, the first day of the African Air Chiefs Symposium, in Dakar, Senegal. His remarks have been edited for length and clarity.

ADF: What made you join the military?

RAKGANTSWANA: The love for it, but way back then, Botswana was faced with these incursions from South Africa. They were most of the time flying into Botswana in pursuit of what was termed to be terrorists then. They were doing these attacks, these attacks on the military bases, attacks on villages that are around, located somewhere around the borders. I come from one small village called Ramotswa, so it's just a stone's throw from the South African border. And these guys would be coming in and they'd be setting off

these bombs, these grenades, so I saw people die — innocent lives. It's that that made me really to go out there and defend my country against those aggressions.

ADF: More recently, Botswana has been notable for being at peace internally and at peace with its neighbors. So, what is the primary use and purpose of the air force in that context?

RAKGANTSWANA: Well, for starters we are facing our internal, transnational crimes, the poaching issue. This is where the air force is very,

A Motswana pilot prepares to land a C-130. Botswana Defence Force personnel conducted free-fall jumps with U.S. personnel as part of joint training in March 2022.

STAFF SGT. JOSHUA DE GUZMAN/U.S. AIR FORCE





very critical, because over and above transporting troops to those areas, we also avail ISR [intelligence, surveillance and reconnaissance] capability. We check that those guys don't come into the country undetected. And it indeed assures our ground personnel that they have good support in their operations. So just sustaining those operations toward anti-poaching is good for them. That is one of our primary roles. The other one is right now we are helping this country fight the terrorists in their country, and that is Mozambique. The air force is critical in sustaining that operation. That is called SADC Mission in Mozambique, or SAMIM. We are doing a lot of flights into Mozambique, sustaining operations, doing rotations of personnel.

The other ones that we are doing as well are the humanitarian relief operations. A country like Mozambique for instance every year without fail experiences floods. Most all the rivers in Southern Africa just dump their water into Mozambique before it goes into the ocean. That is a challenge, and our government will be putting our heads together and saying "let's contribute toward relieving Mozambique." That is where now the efforts come in, and our assets will be collecting the foodstuffs and taking it to Mozambique for distribution to other hard-to-reach areas.

We have extended our humanitarian aid to other neighboring countries. I think the furthest that we've been to so far is Congo-Brazzaville after there was some explosion of the ammo depot [in 2012]. We've been to Malawi, we've been to Zimbabwe, we've been to Mozambique during Cyclone Idai. That one crippled the whole of Southern Africa.

ADF: What are the primary air assets of Botswana's air force?

RAKGANTSWANA: In the airlift, we have those fixed-wing transport aircraft, the Hercules C-130, the CASA 235 and the CASA 212. And then, we have the helicopters, small kinds like the "Squirrels," the AS350, and then we have the Bell 412s. And then the other one is for presidential flights, and the trainers. We do our own training; the only time we have to outsource training is when we procure a new platform, and that is just to do the type of conversion. Thereafter we sustain ourselves because we train instructors in that platform.

Of course, the fighter capability we are working on improving. Right now, we have the F-5s that are proving to be very expensive to maintain because of issues of obsolescence, so we are looking at a possible replacement platform in that

Botswana Defence Force Soldiers board a C-130 Hercules transport plane in July 2021 on their way to serve in the Southern African Development Community Mission in Mozambique.

MQONDISI DUBE/VOICE OF AMERICA

regard. And this is where we are still dealing with the political principles to see that we can get funding toward the platform that we have identified. We're still window shopping in that regard. We haven't really identified which one. And that will be determined by funding. The idea is that we should not lose capability, because we know the importance of having secure skies.

ADF: How big a problem is strategic airlift on the continent, and how does Botswana see its role in contributing to that continental capacity?

RAKGANTSWANA: That one is a challenge, and we as air chiefs know it. Maybe we are unable to solve this or to convince the political leadership about the problem that we are facing. You find that we engage in these operations, or they have expectations from us as air chiefs. They would be saying, "Do this thing," not noting that they have not really resourced us to undertake that operation. What we see now is that we will be faced with this problem of having to airlift personnel, airlift consignment cargo, and we get stuck. Case in point: The SADC mission in Mozambique is proving to be difficult

to sustain. And that is primarily because of the airlift mobility, or lack of airlift mobility. But as the South African Development Community, we have made pledges. One of the countries that has made pledges toward airlift is Angola, and of course Zambia. Zambia has offered the medium-lift transport aircraft. Angola has offered the heavy-lift transport aircraft. We just put our request now through SADC so that it ultimately finds its way to the Zambia force or Angola.

Then the challenge is the turnaround time. If I had that capability, obviously I would respond (snaps fingers) just like that. But now I have to rely on this country to deconflict its own operations from the one that I'm saying is a pressing matter on my side as well. I end up failing in that regard in terms of achieving what I want within reasonable time. What we are discussing at this summit is the importance of having that in place, and that, of course, in line with the African Peace and Security Architecture. It's not like it's going to be just a stand-alone entity. It is going to marry up on the existing structure of the African Union. It will be there with the African Union to identify where they need

Maj. Gen. Hendrick Thuthu Raggantswana of Botswana, middle, speaks at the African Air Chiefs Symposium on March 1, 2023, in Dakar, Senegal.

TECH. SGT. STEVEN M. ADKINS/U.S. AIR FORCE



it, and then they are launched. What we are proposing is that it will be six platforms, and maybe the type of a C-130 and with everything else inclusive, including logistics, training, technical training, and obviously operations in terms of having pilots being able to operate those aircraft. It's one huge capability that we should really aim to have.

ADF: One of the challenges facing African air forces is the ability to repair and maintain the platforms that they have. How big a challenge is maintenance, spare parts and repair for you as an air chief?

RAKGANTSWANA: It's a huge challenge right now. The platforms that we are operating as a struggling economy is that we probably end up settling for something that is cheaper; it is probably old. We operate it for five, six years and then it's due for heavy maintenance. We don't have that capability. It's due for component repair, and we will have to get those components from the OEM — original equipment manufacturer. And because it is old equipment they will be saying, "I can't make this component, especially that you want just one of this component. Because it means resuscitating the factory that was shutting down. So, the minimum that I can avail to you is probably going to be 100 or so." But then I think, "No, I don't need 100. I just need one of those components." The challenge now is looking for this component from different vendors. Sometimes it proves to be very difficult. At the end of it all, we don't get that one; we end up now having to look within these other platforms that I have and saying, "OK, if I had three aircraft maybe that one I should use as a source of spares to support these two." So, we will be stuck with these three aircraft that are not flying or one of those three flying and the other two are used to support this one so that we are able to sustain our operations.

But the other thing now of late is ... especially the issue of costs. With this Russia-Ukraine war, we saw that the transport issue has gone up more than 10 times. In the past I used to ship some components to OEM like in the United States at less than \$100,000 U.S. But right now, at the last I checked, it was about \$800,000. You can see how much that is, and that is just one way. It's just expensive, so much that we sit now with these components here; we sit with these aircraft here that are not doing anything for us.

ADF: With the challenges you've mentioned, how important is a symposium like the AACCS in addressing these challenges for you, your neighbors and the whole of the continent?


RAKGANTSWANA: The AAFA, the Association of African Air Forces, wants to build or show the importance of cooperation, and that, as an individual country, you can't have all that you need. And, therefore, look to the neighboring countries and see their capabilities, and say you as Angola you have this capability that I don't have, so help me in terms of air mobility. You as a certain country, you can probably extend slots to me for training of technicians, so assist me in this regard. And for sure that is going to be a lot cheaper than me having to send these technicians to Europe or the U.S. We are now looking within ourselves and identifying the capabilities that we have so that all members now can benefit from those.

"We will be faced with this problem of having to airlift personnel, airlift consignment cargo, and we get stuck. ... And that is primarily because of the airlift mobility, or lack of airlift mobility."

ADF: A lot of militaries, including those in Africa, are incorporating drones and unmanned aerial vehicles into their assets. Given that you work heavily in anti-poaching, has your Air Force considered incorporating drones?

RAKGANTSWANA: We have ISR platforms in which we are using fixed-wing aircraft, pilot-flown as compared to a drone ... but it's a good capability to have for sure, and we see the importance of this now in our operations out there in Mozambique, because you can imagine sending those guys out there but there are no eyes in the sky. In that case they just end up going into ambushes. That is the importance of drones; that is the importance of intelligence, surveillance and reconnaissance capability. We are shopping around for a drone type of ISR because the advantage of that one is that it can loiter for a long time — 24 hours, 18 hours — as compared to an aircraft that needs to come back to refuel after about five hours or so. □

INSURGENTS SCATTER AS NIGERIA RULES AIR



A Nigerian Air Force pilot launches two Hydra 70 rockets from an A-29 Super Tucano light attack aircraft during training.

SENIOR AIRMAN REBEKAH
MEDEIROS/U.S. AIR FORCE



A VARIETY OF VERSATILE ASSETS HELPS THE COUNTRY TAKE THE BATTLE TO ENTRENCHED EXTREMIST GROUPS

ADF STAFF

Northeast Nigeria's famed Sambisa Forest is known for its low-profile trees and dense thickets, punishing anyone foolish enough to traverse it without a machete. It spreads across 512 square kilometers in Borno State and has served as a refuge for Boko Haram and associated militants.

For years, Boko Haram and the Islamic State West Africa Province (ISWAP) have used the unforgiving forest as a base of operations. Boko Haram kidnapped young girls and hid in the forest. Militants would emerge from the bush, attack security forces and disappear into its cover.



In the past several years, however, Nigerian forces have begun to bombard the forest from the air, bringing militants and their associates running from it in surrender. More recently, newly acquired air assets — especially a dozen A-29 Super Tucano light attack planes — have helped give the army and air force new agility in the area at a reasonable cost.

The Tucanos are part of a growing list of air assets Nigeria is acquiring for all branches of its military and security services. In the past few years, the country has added platforms that help monitor and secure land and sea, including tethered and untethered drones, helicopters, and several types of planes. On a continent where force-on-force warfare is rare, and strategic airlift is a constant challenge, having a versatile array of low-cost aerial assets can help sustain mission effectiveness and value.

High-tech jets can cost millions of dollars to procure and tens of thousands of dollars an hour to operate, which is like “using a Rolex to drive a nail,” as one

expert told Air Force Times. By contrast, the Super Tucano can stay aloft for roughly \$1,000 an hour.

Tucanos also provide a range of weapons options, including wing- and fuselage-mounted machine guns, air-to-air missiles, and laser-guided bombs.

The dozen Tucanos were part of a nearly \$500 million deal with the United States in 2021. The purchase brought the turboprop planes to Nigeria as part of a package that includes spare parts to support several years of operations, contracted logistics support, munitions and a multiyear construction project to upgrade infrastructure at Kainji Air Base in Niger State.

The A-29s have been a crucial part of Operation Hadin Kai, an ongoing counterterrorism effort that began in April 2021 when it replaced the six-year Operation Lafiya Dole.

Leadership News reported in February 2023 that two Super Tucano strikes killed scores of Boko Haram militants as they gathered for a meeting in Gaizuwa on the edge of the Sambisa Forest. The A-29s fired rockets

A Nigerian A-29 Super Tucano taxis down the runway at Moody Air Force Base, Georgia, in September 2021.

SENIOR AIRMAN REBEKAH MEDEIROS/U.S. AIR FORCE



and bombs, killing some and making others flee.

As Nigeria conducted air operations between February 23 and March 9, 2023, more than 1,300 people surrendered, including 699 children, 411 women and 222 men. Nigerian authorities said the total comprised terrorists and their family members.

Voice of Nigeria reported that intelligence showed that some insurgents had planned to attack locations in Gamboru, Kauwa and Monguno in Borno State to disrupt national elections. Instead, a “series of air interdiction operations was carried out at these identified locations,” said Maj. Gen. Musa Danmadami, director of Defence Media Operations. “Feedback revealed that the airstrike dealt with terrorists, as several terrorists were neutralized with their logistics destroyed.”

A NIMBLE AIR ASSET

The A-29 Super Tucano offers tailor-made capacity to Nigeria’s military for light air support, combat and reconnaissance. Sierra Nevada Corp. builds the planes in the

U.S. with its partner, Embraer Defense & Security, a Brazilian company.

The aircraft’s durable design makes it ideal for rugged terrain with unimproved runways and at forward operating bases. It can be configured for one pilot in a single-seat version or for one pilot and a navigator or student in a two-seat version.

It has a maximum speed of 593 kilometers per hour and a cruising speed of 520 kilometers per hour. It can fly at a service ceiling of 10,668 meters and has a maximum takeoff weight of 5,400 kilograms. Its external payload is just over 1,551 kilograms.

AN IMMEDIATE RECORD OF SUCCESS

The A-29s were helping Nigerian forces pressure and decimate insurgent forces immediately upon their arrival in 2021. As a truck trundled through the Sambisa Forest region with four Boko Haram extremists inside, the new planes kept watch overhead and waited for the right moment.

Two of the A-29 Super Tucanos destroyed the truck in the village of Gargash in a two-day operation that targeted three Boko Haram encampments and killed 49 terrorists. The airstrikes on August 30 and 31, 2022, were part of Operation Hadin Kai, the Nigerian Army said.

Airstrikes also targeted hideouts in Minna and Gazuwa, according to Vanguard, a Nigerian newspaper. Lake Chad region counterinsurgency expert Zagazola Makama confirmed the attacks for the paper, noting that strikes killed 29 Boko Haram fighters in Gazuwa and 16 in Minna, in addition to those in the truck.

On December 5, 2021, also as part of Operation Hadin Kai, pilots used Super Tucanos to kill ISWAP commander Abou Sufyan and dozens of his fighters in a series of attacks in Kusuma and Sigir near Lake Chad in Borno State, according to the website Sahara Reporters.

The planes struck an armory base after intelligence and reconnaissance missions detected ISWAP fighters preparing to attack Nigerian troops in the area. Strikes hit a weapons-manufacturing facility, the armory, a fuel dump, and a building filled with vehicles and motorcycles, according to the report.

A week earlier, the Nigerian planes had destroyed gun trucks in the Gajiram area of Borno State, the Daily Post reported. ISWAP fighters there were trying to overrun the town and a forward operating base when Nigerian Air Force pilots struck. Army spokesman Brig. Gen. Onyema Nwachukwu said security forces recovered 10 AK-47 rifles, an anti-aircraft gun, a 60 mm mortar tube and ammunition.

The Nigerian Air Force used the new planes to maintain the pressure into 2022. In January, another Operation Hadin Kai strike reportedly killed ISWAP senior commander Mallam Ari, who was in charge of Borno State’s Kirta Wulgo region and oversaw foreign mercenaries who made improvised explosive devices for the terrorists. Super Tucano strikes killed Ari and several other ISWAP fighters and hit a structure in the area, according to Sahara Reporters.





Nigerian Minister of Defence Bashir Salihi Magashi cuts a ribbon to officially induct A-29 Super Tucano aircraft into the Nigerian Air Force on August 31, 2021. U.S. AFRICA COMMAND

Airstrikes on February 13, 2022, killed Malam Buba Danfulani, another top ISWAP commander, near Lake Chad in Borno State, and others, according to the Nigerian magazine *Northeast Star*. Danfulani was responsible for coordinating the deployment of spies, collecting taxes and issuing passes.

In the fall of 2022, troops with air support attacked villages outside the town of Bama along the edges of the Sambisa Forest. Fleeing militants ran into the rain-swollen Yezaram river to escape the bombardment, where scores of them drowned.

"Most of the Boko Haram elements drowned in the river, and their bloated bodies were found floating on the surface," Bukar Grema, a militia fighter working with the military, told *Agence France-Presse* in September 2022. "Over 100 of them were retrieved from the river and buried by our men."

Civilians in Borno State seemed to appreciate the increased capacity that the Super Tucanos afforded Nigerian security forces. "We're winning the war with the Tucano," Borno resident Adamu Ali Adamu told *The Defense Post*. "We'll drive the terrorists into the Sambisa Forest."

Borno resident Isyaku Umar also praised the difference the planes are making. "War happens because evil people want to play games," Umar told *The Defense Post*. "Kudos to the Tucano for dealing with such evil people here."

As the planes continued to help turn the tide from the air, U.S. officials worked with Nigerian partners to fulfill commitments included in the sale to provide support facilities for the Super Tucanos. In February 2022, Nigerian and U.S. officials broke ground at Kainji Air Force Base on the last phase of a \$38 million project to build support structures.

The cost is part of the larger \$500 million deal. Construction was to include sunshades to house the Super Tucanos, areas for munitions assembly and storage, and an annex for the A-29 flight simulator.

Nigeria isn't the only African nation that uses A-29s. Burkina Faso took delivery of three Super Tucanos in 2011 and used them for border patrols. Mauritania's small air force received at least one Tucano in 2012 to



A Nigerian Air Force pilot uses a flight simulator at Kainji Air Force Base in Nigeria on February 15, 2022. UNITED STATES EMBASSY NIGERIA



T129 ATAK helicopter WILTSHIRESPOTTER



M-346 multirole trainer jet ADRIAN PINGSTONE/WIKIPEDIA



Beechcraft King Air 360 AFRICAIR, INC.



Diamond DA62 with surveillance sensors

ANNA ZVEREVA/WIKIPEDIA



AgustaWestland AW109 Trekker LEONARDO

replace older craft. Angola has taken delivery of six Tucanos for border surveillance. Mali acquired four Tucanos configured for “light attack and close air support,” defenceWeb reported.

OTHER AIR ASSETS

Nigeria was employing a range of air assets before acquiring the A-29s. In February 2016, it used drones to bomb Boko Haram for the first time, according to multiple reports. Police authorities have been using Orion tethered drones since early 2022 to monitor borders and crime scenes, defenceWeb reported.

In March 2023, the Nigerian Air Force confirmed that it had been authorized to acquire more than 50 new aircraft, defenceWeb reported. Among them were:

- **Six T129 ATAK helicopters:** This twin-engine Turkish attack and reconnaissance helicopter seats two and can deliver 20 mm cannon fire and a dozen antitank guided missiles.
- **24 M-346 multirole trainer jets:** This twin-engine tandem-seat jet offers advanced pilot training through a range of technology. It also lets pilots interact in live, virtual and computer-generated environments.
- **Two Beechcraft King Air 360 transport planes:** This plane can carry 11 people and has a reconfigurable interior that can accommodate cargo or serve as an air ambulance.
- **Four Diamond DA62 surveillance aircraft:** The plane can be used for law enforcement, search and rescue missions, surveillance and disaster management.
- **12 AgustaWestland AW109 Trekker multirole helicopters:** This aircraft’s doors allow for rappelling and fast-roping, and it can be used for surveillance and reconnaissance, armed escorts, troop transport, search and rescue, and medical evacuation.

Despite the success of Nigeria’s air campaign against insurgents, Air Marshal Isiaka Oladayo Amao, chief of Air Staff, told the media in March 2022 that all branches of the military are essential to the long-term security of Nigeria.

“In any war, one major tactic is to exploit your adversaries’ weakness,” Amao said. “Our monopoly of controlling the air space gives us a fighting leverage and advantage in the skies. The insurgents and terrorists do not have the means to purchase, fly or maintain aircrafts.

“However, it may be inaccurate for us to conclude that air assets are now more important than land or sea assets. The fight is dynamic, and all the services are building capacity not just for the present events, but to protect Nigeria’s territory in the immediate to long term.” □

Female Tank Drivers HELP SECURE SOMALIA

ADF STAFF





African nations have spent years working to equip Somalia's fledgling government to achieve stability. As the African Union peacekeeping mission gave way to the AU Transition Mission in Somalia, the work has continued. Women have been an essential element of that effort. Lance Cpl. Dorine Chekwemboi, a Ugandan tank driver serving in the mission in Mogadishu, and her colleagues continue to contribute to peace and security as Somalia begins to take more control of its future.



**LIGHT,
VERSATILE,
AFFORDABLE**

Asymmetric Warfare in Africa's Hot Spots Favors Smaller COIN Aircraft Over Fighter Jets

ADF STAFF

Modern fighter jets are marvels of power and complexity. Armed with air-to-air missiles, they can reach speeds of 1,600 kilometers per hour. They are also stunningly expensive. The current generation of fighter jets start at about \$100 million each, and it is estimated that each plane will cost \$1 billion in operational expenses and maintenance over the course of its optimal life span.

There's also the matter of usefulness. In anything less than air combat and missile strikes, a fighter jet is overkill. Since the end of the Cold War, air forces have seldom flown in heavily contested airspaces, and instances of facing advanced military rivals with sophisticated defense systems and avionics are extremely rare.

These days, warfare is largely asymmetric, waged against insurgents and terrorists. This is particularly

the case in several parts of Africa. There is no air-to-air combat. For this kind of warfare, smaller, more maneuverable craft are needed. These counterinsurgency, or COIN, aircraft often were designed to be trainers for pilots. They cost only a fraction of the price of a fighter jet and are far easier, and less expensive, to maintain. They can be adapted to new uses in light attack, reconnaissance and as utility "pickup trucks of the sky."



The Westland Lynx, introduced in 1978, was used all over the world, including in Nigeria and South Africa. Some may still be in service. This one is from the South African Navy fleet.

Aviation website Key Aero says that light attack aircraft are a "cheap and ready source of airpower" for cost-concerned countries facing insurgencies. The per-hour operating cost for such aircraft typically is about \$2,000, or 2% to 4% of the cost of advanced fighter jets.

LEFT: The Cessna Bird Dog had a history of use as a liaison, reconnaissance and observation counterinsurgency aircraft. Introduced in 1950, it saw use in many parts of the world.



The Vietnam War triggered the need for the development of better COIN aircraft. The Cessna A-37 Dragonfly saw service throughout the world. Some were reportedly still in service as recently as 2016.

A Beechcraft AT-6 Wolverine experimental aircraft flies over White Sands Missile Range in New Mexico. The light attack COIN aircraft is based on the Beechcraft T-6 Texan II trainer.

ETHAN WAGNER/U.S. AIR FORCE



SMALL WORKHORSES

ALEC SMITH, INTELLIGENCE AND DEFENSE ANALYST

Aviation experts say counterinsurgency aircraft have a variety of uses:



Intelligence gathering, including reconnaissance and surveillance.



Aerial bombardment and close-air support.



Transportation in support of combatants and civilians, including casualty evacuations on a limited basis. Historically, small helicopters have been the most effective COIN aircraft for casualty evacuations.



Psychological operations, such as loudspeakers and radio broadcasts. They also are used to drop counterpropaganda material, including leaflets and pamphlets.



Logistics and utility, such as dropping emergency supplies.



A U.S. Air Force O-2 Skymaster drops leaflets over the Republic of Vietnam in July 1970. SGT. WILLIAM DIEBOLD/U.S. AIR FORCE

The initial cost also is lower, Key Aero noted, with one baseline COIN fighter starting at about \$10 million.

Nigeria, with one of the largest air forces in Sub-Saharan Africa, was one of the first to recognize the usefulness of the smaller planes.

“With its extensive combat experience, first in Liberia as part of the Economic Community of West African States monitoring group peace-keeping force, and then in the long war against Boko Haram, the Nigerian Air Force soon found that its frontline fast-jet fighters were much less useful for close air support than its Aero L-39 and Dassault Alpha Jet advanced trainers,” reported news site Times Aerospace. “The latter have formed the backbone of Nigeria’s air campaign against the Islamist insurgent group, while the type has also been used operationally by Cameroon, Egypt, Morocco and Togo.”

Alec Smith, an intelligence and defense analyst for Grey Dynamics, noted that the United States reportedly

has considered scaling down its drone program with an eye toward using manned COIN aircraft.

“As the war between nation-states becomes less prevalent, and localized insurgencies become more problematic and difficult to manage, COIN aircraft will play a large role in mitigating and limiting the scope of insurgent operations in the future,” he wrote.

These COIN planes are not always based on trainers. The U.S. Air Force in 2022 announced that it had chosen the AT-802U Sky Warden, produced by L3Harris Technologies and agricultural aircraft maker Air Tractor, to take on its Armed Overwatch mission, conducting counterterrorism operations and irregular warfare in places such as Africa. Forbes magazine reported that the Sky Warden is based on a single-prop crop-duster.

The Sky Warden was chosen for its large payload; its ability to fire missiles, drones and small munitions; and its ability to carry multiple sensors and up to seven tactical line-of-sight and beyond line-of-sight radios, Forbes noted.

COIN aircraft are not just fixed-wing manned planes; drones and helicopters also have been used in asymmetric warfare. Helicopters, however, have obvious vulnerabilities to groundfire, and drones tend to be limited by line-of-sight issues.

Smith notes that helicopters have been heavily used as COIN aircraft but have limitations.

“Despite appearances, the rotors are actually incredibly brittle,” he told ADF in an email. “Small arms fire can prove fatal to a helicopter, and because helicopters tend to fly lower and slower than fixed-wing aircraft, they are at an increased exposure to this potentially fatal ground fire. Helicopters certainly play important roles in COIN operations, such as enhancing air mobility and casualty evacuation, but they are only as useful insofar as the circumstances permit.”



The Antonov An-2 was introduced in 1947 and stayed in production for more than 50 years. It was used by countries throughout the world, including Egypt.

BEGINNINGS OF COIN CRAFT

The use of aircraft in counterinsurgencies dates almost to the dawn of aviation. But historians say that modern COIN planes date to the early 1950s, when the U.S. began experimenting with trainer aircraft in Korea and years later in Vietnam.

“In Korea, U.S. airmen flew armed versions of the North American T-6 Texan piston-engined trainers dubbed ‘Mosquitos,’ primarily for artillery spotting and forward air control,” wrote Robert Dorr for *The Year in Defense: Aerospace Edition*, in 2010.

Over the years, military experts have listed the accepted standards for successful COIN aircraft. They are:

- The aircraft must be durable, capable of enduring long periods of use without servicing the engine or avionics. They must be cost-effective to buy and maintain.



Grumman OV-1 Mohawk observation and attack planes were used extensively in the Vietnam War and later in other parts of the world.

South African Company Producing NEW COIN AIRCRAFT

ADF STAFF

The first Mwari surveillance and precision strike plane, originally known as the AHRLAC, has been spotted in Mozambique, sporting Mozambican markings.

DefenceWeb reported in March 2023 that the plane, which can be used in counterinsurgency or COIN operations, was spotted in Cabo Delgado province. Flight tracking data showed it flying around Nacala at the end of January 2023.

military aircraft in South Africa since the Rooivalk attack helicopter first went into service in 1999. Production was delayed in February 2019 after problems that included contractual, intellectual property and funding disputes. A rescue plan was developed, and production resumed in September 2022.

The Mwari is marketed as a relatively inexpensive alternative to high-end military aircraft for surveillance, maritime patrol and counterinsurgency operations. It also can be used for training. It has a service ceiling of up to 9.5 kilometers and offers a maximum cruise speed of 460 kilometers per hour, a mission range of more than 1,000 kilometers with ordnance, and an overall flight time of up to 6.5 hours.

Company officials say the aircraft also offers a short takeoff and landing capability, with retractable landing gear optimized for semi- and unprepared airstrips or sites. The aircraft features an unusual twin-boom,



The Mwari is a new surveillance and precision strike airplane manufactured in South Africa.

PARAMOUNT GROUP

AHRLAC is short for advanced high performance reconnaissance light aircraft. DefenceWeb reported that it is the third AHRLAC built, after two prototypes, and is one of two preproduction aircraft. It first flew in April 2022.

The aircraft are being produced by Paramount Aerospace Industries of South Africa. Paramount in September 2022 said that four aircraft were on the production line at the Wonderboom Airport factory near Pretoria, and there were orders for nine of the aircraft from two customers. The aircraft are designed to compete with other small propeller-driven craft, particularly the successful Brazilian-made Embraer A-29 Super Tucano. There are more than 260 Super Tucanos in service around the world, including in Mauritania and Nigeria.

The Mwari has been under development for more than a decade. It is the first newly designed manned

single-pusher engine and high-mounted forward-swept wing configuration. The company announced plans to sell the planes for about \$10 million each, which is comparable to similar COIN planes sold in other parts of the world.

The website The National Interest has reported that the Mwari is being marketed specifically to African countries. The website quoted the company as saying, "The types of threats that countries around the world face has changed significantly over the last few years. Many of the threats being faced do not justify the operating cost of fast-jet fighters."

The company also has plans to build a second plane, the Bronco II, which is designed to be rapidly disassembled, transported and reassembled in the field by a small crew. The company plans to build the Bronco II in Crestview, Florida, in the United States.



The Rockwell OV-10 Bronco was introduced in 1959. The Royal Moroccan Air Force acquired six of them for counterinsurgency operations.



Two pilots prepare to fly a newly arrived Super Tucano light attack aircraft. AFP/GETTY IMAGES

- They must be capable of getting airborne quickly in emergencies.
- They must be tough enough to survive rough landings on difficult, unpaved terrain. Ideally, they should be capable of executing short takeoffs and landings from makeshift runways.
- They must be simple to pilot. Simple operating procedures make it easier to train pilots. The simplicity of operation also makes it easier to maintain the aircraft — a critical point in keeping an air fleet operational.
- Such aircraft must have the capability of low “loitering” speeds, combined with good range and fuel consumption.
- They must be able to access remote areas rapidly while supporting troops with reinforcements and supplies.

COIN programs became increasingly important around the end of the 20th century when asymmetric wars

became the norm. Some experts contend that drones could replace manned COIN aircraft in the future.

Key Aero says it's too soon to assume that drones eventually will replace COIN planes: “For one thing, drones are not necessarily the ‘cheaper option’ as commonly assumed. A recent report from the ... Center for Strategic and International Studies noted that drones can cost as much as manned aircraft in the long run. The annual personnel costs for an ISR MQ-9 Reaper [drone], for instance, run at around \$3 million.”

Doug Barrie from the International Institute for Strategic Studies told Key Aero that cost comparisons between drones and manned COIN craft can be misleading. Initially, he said, a COIN manned plane is going to be more expensive. “But that doesn't take into account the training, the satellites you need to sustain in orbit for a [drone] to function, or the back-end support for the operation and exploitation.” And, he said, with a drone, “unless you've got a satellite link, you're limited to a direct line of sight data link. You need to invest in a satellite capability or get someone to do that for you.”

Smith told ADF that it is “almost certain” that drones will dominate the air domain of counterinsurgency operations in the future, but there is still a need for light attack aircraft.

“This does not necessarily mean that light, manned aircraft won't have a place going forward; it just means that they will be significantly less prevalent,” he said. “Manned aircraft will still be the primary tool for operations in contested airspace. Manned aircraft are useful when a certain degree of instant human intervention in the decision-making process is needed. Manned aircraft tend to be faster, so when rapid response is needed to a developing situation, drones are really not the best option.” □

SHARING THE BURDEN

COUNTRIES EXAMINE WAYS TO MEET THE
CONTINENT'S STRATEGIC AIRLIFT NEEDS

ADF STAFF



Two C-130H Hercules delivered to the Nigerien Armed Forces sit on the flightline in Niamey. The C-130 remains the most popular military transport aircraft in the world due to its design and durability.

TECH SGT. STEPHANIE LONGORIA/U.S. AIR FORCE

As South Sudanese peacekeepers walked off a Kenya Air Force C-27J Spartan military transport aircraft in the Democratic Republic of the Congo (DRC), they were fulfilling a pledge.

South Sudan's president had promised to send 750 troops to take part in the East African Community Regional Force. Their arrival in Goma on April 2 and 3, 2023, meant the mission, designed to bring peace to the volatile eastern DRC, had reached full deployment.

For South Sudan, a country that has hosted foreign peacekeepers since its independence, the ability to send troops abroad was a milestone.

"We are very proud today because the flag of the Republic of South Sudan is going to be flying as a region continuing to contribute to stability and peace," said then-Minister of Defense and Veteran Affairs Angelina Teny before the deployment. "This is a great opportunity for us to change the image of this country."

It also showed the importance of airlift partnerships. The deployment might not have been possible without the support of the Kenya Air Force. The KAF also flew 100 Burundian Soldiers to the DRC in March 2023.

For years, peacekeeping missions have been hampered by a lack of air mobility. Countries simply couldn't move troops and equipment where they were needed in a timely fashion.

"Strategic airlift is an asset that every nation dreams of, but having such equipment is quite expensive," KAF Commander Maj. Gen. John Mugaravai Omenda told ADF. "And looking at our [gross domestic product], generally in Africa, it is a challenge to operate strategic airlift."

To solve this shortfall, countries are looking at innovative ways to acquire aircraft, maintain them and pool resources. For the continent, this could be the difference between intervening on time to stop a crisis and arriving too late.



Members of the East African Community Regional Force greet members of the South Sudan People's Defence Forces in Goma. EAST AFRICAN COMMUNITY REGIONAL FORCE

Kenya Air Force Commander
Maj. Gen. John Mugaravai Omenda ADF STAFF



THE CHALLENGES

Many governments across Africa's 30 million square kilometers are responsible for large landmasses with limited road, railway or port infrastructure. This presents a problem sometimes called the "tyranny of distance."

The continent has 204 kilometers of roads per 1,000 square kilometers, about 22% of the global average. Only about one-quarter of the roads are paved. Infrastructure is not evenly distributed, meaning developed population centers are often far away from conflict zones in remote regions.

"Our region is vast [and] characterized by limited transportation infrastructure, hence [it] requires effective air mobility mechanisms to bridge distances, support replenishment of troops in theatre ... and attend to humanitarian assistance," Rwandan Air Force Lt. Gen. Jean Jacques Mupenzi told *Air & Space Forces* magazine.

When that air mobility is not available, the results can be devastating.

In 2012, as insurgents pushed to take over Mali, an Economic Community of West African States intervention was delayed for months due to a lack of airlift. Similar delays occurred in Sudan's Darfur region in 2010, when African Union troops were grounded as the conflict exploded. Eventually, the Netherlands stepped in to provide the necessary airlift.

Once arriving in a country, a lack of roads makes sustaining troops a challenge. During the U.N. mission in Mali, peacekeepers spent weeks moving supplies via truck convoys from the capital city, Bamako, to remote outposts in places such as Timbuktu. A former sector commander recalled the "logistics nightmare" of battling

dust storms, floods and tire-puncturing rocks to move supplies across the country.

"Normally they say operations drive logistics, but I think in Africa, logistics drive operations because the operations must be based on what logistics are available," said retired Brig. Gen. David Baburam, former head of AU Mission Support. "You can't get the troops to location A or B if you don't have the means of air transport to take them there. You can't keep troops in the operational area for three months if you can't feed them."

FINDING THE RIGHT PLATFORM

The two broad categories of airlift are strategic and tactical. Strategic airlift is provided by large planes designed to move troops and heavy equipment to a location. Tactical aircraft involves smaller planes or helicopters that supply troops throughout a deployment.

For the heaviest strategic lift requirements, defined by the Africa Center for Strategic Studies (ACSS) as capable of moving equipment for one brigade, options are limited. These aircraft, with maximum payloads ranging from 45,000 to 136,000 kilograms, are expensive to acquire and maintain. A C-17 Globemaster can cost more than \$300 million with roughly the same amount necessary for repairs and maintenance over its life cycle.

For most peacekeeping and emergency response operations on the continent, medium airlift capacity is the most practical. ACSS defines this as capable of transporting one to two battalions and their equipment to a location in multiple trips over the course of 14 days. These aircraft have a payload of 9,000 to more than 36,000 kilograms and are more affordable.



Members of the South Sudan People's Defence Forces arrive for deployment at Goma International Airport in the Democratic Republic of the Congo. AFP/GETTY IMAGES

To meet this need, some countries have turned to the C-130, a plane first built in 1957, which has proved to be reliable and cost-effective. Today, the C-130 is the most popular transport aircraft used by air forces around the world. There are 858 C-130s or the related L-100 in use, making up 20% of the global military transportation fleet.

In an analysis of different platforms, U.S. Air Force Maj. Ryan McCaughan said the C-130 is best suited for regional missions due to its range of more than 2,700 kilometers, the capacity to carry 19,000 kilograms of cargo and its ability to land in rugged environments.

"The C-130 is right for Africa," McCaughan wrote in a 2019 analysis. "Primarily in terms of cargo capacity, flight time, and unimproved surface landing capability, this asset provides the answer for a region." Ten African countries fly the plane.

A SHARED EFFORT

Nations are examining ways to team up to maximize their resources. One project under the African Union is the creation of an Africa Air Mobility Command Centre that would include an air transport sharing mechanism. This would offer a way to use the continent's airlift resources to support peace and security requirements.

Under the plan, nations with air capabilities would agree to provide support when called upon. Planes could be used to transport troops or equipment for a security operation, to evacuate people during a humanitarian crisis or move aid in response to a natural disaster.

"I think it's every African's dream to see an African airplane with all African flags across its tail, flying across

MILITARY TRANSPORT AIRCRAFT WORLDWIDE

TYPE	ACTIVE FLEET	SHARE
C-130/L-100	858	20%
King Air	289	7%
C295/CN235	284	7%
C-17	281	6%
An-24/26	221	5%
11-76	206	5%
An-30/32	141	3%
Cessna 208	129	3%
Y-8	116	3%
A400M	109	2%
Other	1,655	39%
TOTAL	4,289	100%

Source: World Air Forces 2023



“The C-130 is right for Africa. Primarily in terms of cargo capacity, flight time, and unimproved surface landing capability, this asset provides the answer for a region.”

~ U.S. Air Force Maj. Ryan McCaughan

A South African Air Force C-130 flies from Waterkloof Air Force Base. REUTERS



A Kenya Air Force Spartan C-27J military transport aircraft lands in Goma, Democratic Republic of the Congo, with South Sudanese troops to take part in a regional intervention mission. EAST AFRICAN COMMUNITY REGIONAL FORCE

the continent providing relief and support to Africans,” said Tunisian Air Force Col. Kais Sghaier during a 2022 conference in Botswana, where a working group discussed the command center.

Such arrangements have been successful in other parts of the world. For example, the Movement Coordination Centre Europe, based in the Netherlands, is a partnership of 28 nations that provides airlift, sealift, air-to-air refueling and ground transportation to member countries.

Countries also are examining the need to create airlift sharing mechanisms at the regional level, particularly to support the Africa Standby Force, which is aligned to the regional economic communities. The force is mandated to respond to crises in as few as 14 days, but often has been unable to meet that timeline.

“In our regional economic community, the Southern African Development Community, we face a lot of disasters and crises, and we don’t have the requisite airlift capability,” Maj. Gen. Hendrick Thuthu Rakgantswana, Botswana’s air chief, told *Air & Space Forces* magazine. “So, it means, now, that we have to come together and pool our resources.”

Such cooperation was on display in 2022 and 2023 when Zambia and Angola provided airlift to move personnel and equipment to the Southern African Development Community’s Mission in Mozambique.

“This mechanism is the answer — we just now have to make it fit in the existing structures,” Rakgantswana said.

Countries also are looking at ways to pool resources to enhance buying power. One idea is for a group of nations to join to buy a small fleet of transport aircraft that would be jointly owned and operated. This follows the model of the Hungary-based Strategic Airlift Capability’s Heavy Airlift Wing, a partnership of 12 nations that shares air resources.

During the African Air Chiefs Symposium in 2023 in Dakar, Senegal, air leaders expressed optimism that such partnerships and joint efforts will develop.

“If everything improves, I think we can partner with other nations, because that’s the idea of this forum, to try and bring all these assets together under common use and apply them whenever the need arises,” said Omenda of Kenya. “So, yes [the aircraft] are expensive, they are few, but with collaboration amongst nations we can make it.” □

THE DIZZYING POSSIBILITIES OF

DRONES



UAVS ARE VALUABLE IN DEFENSE, BUT RISKS INCLUDE EXTREMIST ATTACKS AND THE USE OF ARTIFICIAL INTELLIGENCE

ADF STAFF

Nigeria deploys drones at border crossings to increase security along its porous frontier and to identify potential threats while they're still several kilometers away.

The Orion drones, manufactured by the French-American company Elistair, operate at the end of a 100-meter Kevlar cord. The tether provides power for up to 50 hours of flight time and secure, unjammable communication with operators. The drones are part of Nigeria's fleet of unmanned vehicles that makes it one of the continent's major players in drone technology.

The terrorists that Nigerian authorities are looking for likely are watching them with drones of their own. According to analysts, terrorist groups such as Boko Haram and its offshoot, the Islamic State West Africa Province, use them for intelligence-gathering while also experimenting with turning inexpensive, commercially available drones into flying improvised explosive devices (IEDs) that they can use to launch attacks on civilian and military targets.

Nigeria is representative of Africa at large as the rapid proliferation of drone technology hints at a looming arms race. Already, drones are reshaping the way militaries from Morocco to South Africa protect their citizens,

monitor their coastlines, combat wildlife poaching and more.

The growth of military-grade drone technology runs parallel to the accelerating availability of civilian-grade commercial drones, many of them made and marketed by China, that have the potential to be weaponized by extremist groups.

"It's an unsophisticated technology that gains sophistication quickly," Adam Rosman, managing director of South African drone manufacturer Aerial Monitoring Solutions, told ADF. "There is a lot of possibility in Africa."

WHO HAS DRONES?

The first drones deployed in Africa took to the skies in 1978, launched by South Africa to monitor the civil war in what was then Rhodesia. South Africa produced the continent's first homegrown drones, also known as unmanned aerial vehicles (UAVs), in the late 1980s. The use of modern drones began in 2001 when Botswana ordered a number of Israeli-made Silver Arrow Micro-V UAVs. Since then, drones increasingly have become must-have technology for governments across the continent.



Drones are being used by militaries across Africa that seek a low-cost way to boost their capabilities in the air, on land and on the water. AFP/GETTY IMAGES

Nearly every country on the continent uses drones in some form. In most cases, those uses are peaceful — from delivering health care supplies to remote communities to monitoring wildlife preserves under threat from poachers.

"THE AFRICAN CONTINENT IS BECOMING A KEY SITE FOR THE ADAPTATION OF DRONES TO MANY MILITARY AND NONMILITARY PURPOSES."

— **Nichola Heras**, senior director for strategy and innovation
at the New Lines Institute for Strategy and Policy



Turkey's Bayraktar TB2 drone, which was deployed during the Libyan civil war, has attracted the interest of multiple African countries looking to add drone technology to their arsenals. AFP/GETTY IMAGES

The COVID-19 pandemic cast a spotlight on Africa's nascent drone capacity as countries used aerial and ground-based drones to deliver vital public health information and to monitor lockdowns.

"The African continent is becoming a key site for the adaptation of drones to many military and nonmilitary purposes," Nichola Heras, senior director for strategy and innovation at the New Lines Institute for Strategy and Policy, told ADF.

Nations are less transparent about their drone use when it comes to their militaries. Critics say that lack of transparency leads to concerns about whether drones are being used in accordance with international human rights standards and traditional rules of engagement.

"This hinders open debates on the military use of drones in Africa," the Netherlands-based peace organization PAX commented in

a report on drone use on the continent. The PAX report listed 20 countries in North Africa, the Sahel and the Horn of Africa that have acquired military-grade drones. Morocco also manufactures them.

"An uncountable number of drones are increasingly monitoring and impacting lives all over North Africa, the Sahel and Horn of Africa," PAX reported.

In Sub-Saharan Africa, South Africa has become another major actor in the drone industry. South Africa manufactures drones for sale to other countries and has considered deploying them along its 5,244-kilometer border. Nigeria also makes its own drones. Cameroon acquired small military drones in 2018. Kenya has deployed drones to monitor al-Shabaab insurgents in neighboring Somalia. The Democratic Republic of the Congo and Mozambique also have deployed drones in combat.

Botswana, Côte d'Ivoire, Sudan and Zambia have added mid-sized tactical drones to their military fleet. The success of Turkish Bayraktar TB2 drones in Libya's civil war raised the profile of the weaponized drones, and militaries in Ethiopia, Morocco, Rwanda, Togo and Tunisia have acquired them. Angola is considering adding them as well.

"Turkey's drone use in Libya demonstrated to middle- and lower-middle-income nations across the world that drones would provide them with an air force on the cheap that could have devastating impacts on the battlefield," Heras said.

A FORCE MULTIPLIER – WITH LIMITS

Whether they're tracking illegal fishing boats at sea, pursuing poachers across a wildlife preserve or launching attacks against terrorist cells, drones have become a force multiplier for security agencies across the continent.

"The use of UAS [unmanned aerial systems] represents a new iteration of digital technology," analyst Karen Allen wrote for the Africa Center for Strategic Studies.

The low cost of drone technology relative to a full-scale naval ship or air force jet means that cash-strapped militaries can add capabilities on a shoestring. Drones with infrared technology can see in the dark, a useful tool for observing poachers who often operate under the cover of night. They also can hover over a target or even follow one for an extended

period. Their small profile makes them hard to spot and harder to shoot down.

The presence of drones above a fishing vessel, along a border or above a wildlife park also can sow doubts in the minds of would-be bad actors — doubts that can make them halt illegal operations, according to Rosman.

Despite their capabilities, drones have limits. They can be disabled through jamming or hacked and turned against their operators. They can be grounded by sandstorms, dense tree canopies or thick clouds, all conditions found routinely across Africa.

Drones also operate for limited amounts of time before having to refuel or recharge. That can make it a challenge to cover vast distances effectively.

"A drone is not a silver bullet that is going to solve all your problems," Rosman told ADF. "You need people on the ground."

Those limitations often are ignored in favor of the mystique associated with drone technology, he added. African leaders are bombarded with pitches from countries and companies eager to sell them drone technology, some by making promises their equipment can't keep.

On top of that, military leaders sometimes expect drones to do things they're simply not capable of, such as see inside a tank.

Nigerian military leaders and officials from Elistair demonstrate the Orion drones Nigeria deploys for border security. ELISTAIR





Fighters on both sides of Libya's civil war used commercial drones for surveillance and intelligence and military-grade drones to attack targets. AFF/GETTY IMAGES

"You can always tell what movies they've been watching," Rosman said.

The quest for the most advanced drones has produced a jumble of technology from multiple countries, including China, Iran, Israel and Turkey. Users navigate a hodge-podge of software and languages, according to Rosman.

After buying the technology, some leaders then refuse to spend the extra money to train operators, opting to have them figure it out on their own. That "do-it-yourself" approach can result in drones lost on the bottom of the ocean or lying in a pile of wreckage on the ground. Other times, the equipment goes nowhere at all.

"There's a huge amount of equipment on this continent that's not being used," Rosman said.

AI ARMS RACE

In their rush to buy drones, African nations soon could find themselves becoming the testing ground for the next step in drone technology: artificial intelligence.

"Africa is an emerging market for this trend," Heras told ADF. "When paired with potential military capabilities, it could be a key site for prototyping autonomous drones in military contexts."

The Libyan civil war might have already provided a glimpse of that future. With nearly 1,000 drone-based air strikes, Libya became a showcase for using them in combat. U.N. Special Representative to Libya Ghassan Salame called the conflict "the largest drone war in the world."

From that battlefield emerged a United Nations report suggesting that an AI-equipped Turkish Kargu-2 drone may have, in the report's words, "hunted down and remotely engaged" enemy fighters without orders from human operators.

The Kargu-2's developer describes the quadcopter drone as designed for loitering above a target with fully autonomous navigation and precision-strike capabilities. The strike action requires a human handler to be involved, according to the Kargu-2's website.

It's unclear, however, whether that is how the attack actually happened, according to the U.N. report.

"Once in retreat, they were subject to continual harassment from the unmanned combat aerial vehicles and lethal autonomous weapons systems," the report's authors wrote.

Zachary Kallenborn, a part-time fellow at the Center for Strategic and International Studies' Strategic Technology Program who studies drones, told The New York Times that the report suggested that for the first time an AI-capable weapons system independently found and attacked people.

Kallenborn told ADF all the components needed to create such a drone already exist.

THE FUTURE: SWARM ATTACKS

Libya's experience with drones has been unique to the continent, according to Brendan Cannon, who studies the implications of drone technology at Khalifa University in the United Arab Emirates. But that may not be the case for much longer.

"I would say that an arms race is in the offing but getting a slow start for reasons related to resource constraints and the availability of drones," Cannon told ADF in an email. When that arms race begins, it could play to the strengths of extremist groups if countries are not careful, he added. Commercially available drones could be turned into weapons despite being able to carry only light payloads.

"It will potentially give them an advantage to prosecute armed attacks (albeit on a small scale) on soft but highly visible targets of state power, such as presidential palaces or police stations on account of inadequate, to no air defenses in most states," Cannon said.

Kallenborn said software advances could help extremists counter governments' military-grade technology by using dozens or hundreds of commercially available drones to create "swarm" attacks.

For the first time in history, drone technology has created the potential for nonstate actors to control the skies over a given area, Kallenborn told ADF.

Allen has suggested that countries combat the potential drone arms race by closely monitoring and possibly restricting imports of drone technology — a tactic other analysts see as difficult to execute effectively, given the continent's porous borders and the many legitimate uses for commercial drones. Groups could import racing drones, for example, and convert them to flying IEDs, Rosman said.

"There is currently no effective counter to the use of drones in this manner," Heras said. "The effects of nonstate forces using large fleets of small, highly mobile, low-profile commercial drones against most African militaries should keep general staffs across the continent up at night." □

KEEPING THE FLEET AIRWORTHY



The Cost, Parts and Training Needed to Maintain Aircraft Often Are Ignored Until It's Too Late

ADF STAFF

The South African Air Force is one of the largest in Sub-Saharan Africa. Its fighter jet fleet is among the most advanced overall on the continent, consisting of Saab JAS 39 Gripen. The air fleet includes 15 attack helicopters.

But as of mid-2023, half of the Gripens were grounded. And the most important helicopters in the fleet, the Oryx transport and Rooivalk attack helicopters, were largely grounded as well.

Of the 11 airframes in the Rooivalk fleet, only four were serviceable, with seven either unserviceable or undergoing maintenance, defenceWeb reported. Of the 23 engines in the fleet, only 13 were serviceable.

The situation with the Oryx helicopters was equally bleak. Within the fleet of 39 helicopters, just seven were operational. Thirteen were at a state-owned servicing center, and 19 were at squadrons awaiting servicing.

The problem was underfunding for maintenance and service. The Rooivalks were in the midst of a 15-year overhaul of engine and transmission systems, but government officials said there was insufficient funding to do anything more than overhaul four engines. The status of the air force's helicopter fleet is not likely to improve in the foreseeable future, with its budget cut by 30% for 2023-2024.

Officials grounded the Gripen fleet in August 2021 after budget cuts left the air force without a maintenance contract. Without maintenance, they were not approved for flight, leaving the country without its main fighter jet.

AeroTime news service reported that a new contract went into effect in September 2022 — but on a limited basis. After negotiations between the country's military procurement agency and the maintenance companies Saab of Sweden and GKN of the United Kingdom, the two sides reached a compromise. The three-year contract supports only 13 of the total Gripen fleet of 25 jets. The remaining 12 jets have been mothballed.



A U.S. Air Force advisor speaks with Djiboutian airmen about maintenance for the L-410 Turbolet aircraft in Djibouti.

TECH SGT. IAN DEAN/U.S. AIR FORCE

COMMON PROBLEM

It's a common problem for countries seeking to build an air force: purchasing aircraft but not budgeting for the cost of keeping them in the air. They either fail to budget sufficient money for maintenance or are forced to cut expenses. With the air forces usually being the smallest branches of the military throughout Africa, there is a consistent lack of funding to maintain a viable, useful air fleet. And it begins, researchers say, with countries buying the wrong aircraft.

In "African Airpower: a concept," a 2020 paper, author-educator Stephen Burgess wrote that many air forces "struggle to maintain disparate fleets of operational aircraft." He added: "While the fleets may look reasonably good on paper, the majority of aircraft are frequently grounded due to insufficient maintenance or lack of spare parts."

Another problem, he said, was something known as "a fleet of ones" — a fleet consisting of just one or two of too many kinds of platforms.

Kenya Air Force Commander Maj. Gen. John Mugaravai Omenda said that problem is commonplace. During the 2023 African Air Chiefs Symposium in Dakar, Senegal, he told ADF that his country's wide assortment of military aircraft can be difficult to maintain and get parts for.

"Variety (of aircraft) is the first challenge," he said. "So, we need to source wide and large for spares. Most of these assets are aged, and their support is rapidly going down. It's a bit demanding in terms of acquisition of these parts and training of the technicians to maintain them."

TOO MANY PLATFORMS

The 2023 World Air Forces Report shows the extent of the problem of too many platforms in African air forces. The continent has 54 countries, but only 28 have air forces. There are a huge variety of fleets. Some examples:

- **Zambia**, regarded as having one of Southern Africa's best air forces, has a total fleet of about 100 aircraft, with 16 different platforms. Of those platforms, three have only one aircraft; four platforms have only two.
- **Tanzania** has about 40 aircraft, with 14 platforms. Three platforms have one aircraft each; seven more platforms have just two.
- **Kenya** has about 80 aircraft, with 18 platforms. Eight of its platforms have no more than three aircraft.

Having too many platforms creates a host of problems.

It's difficult to stock sufficient spare parts for so many varied aircraft. Each type has its own maintenance issues and requires special training to repair. Many have to be sent to other countries for repairs. Many times, spares are no longer available. And it's hard to train pilots to fly so many types of aircraft.

In a report, "Building Africa's Airlift Capacity: A Strategy for Enhancing Military Effectiveness," authors Birame Diop, David Peyton and Gene McConville wrote: "In addition to high costs, airlift platforms need support over the long term. The lifecycle cost of airlift systems, including maintenance, fuel, and crew expenses, often exceeds the initial purchase price of individual aircraft. Overlooking these costs has resulted in aircraft that are



An A-29 Super Tucano pilot performs a preflight inspection at Moody Air Force Base in the United States in September 2021. After more than a year of training, the final batch of aircraft was being sent to Nigeria.

SENIOR AIRMAN REBEKAH MEDEIROS/U.S. AIR FORCE

Mechanics from the U.S. and Nigeria work to restore one of Nigeria's C-130 transport planes in a military-to-military engagement.

LT. COL. DAVID MACKENZIE/U.S. AIR FORCE



frequently out of service or operated while failing to meet safety standards.”

Burgess noted that some of Africa’s air forces also have a problem with staffing.

“A less talked about challenge is retention,” he wrote. “Few African air forces have service commitments. In many countries, the minute an airman is adequately trained in key aerospace disciplines, he becomes extremely marketable to the civilian aerospace industry and separates from the service. Thus, air forces are left with an inadequate number of motivated airmen, many of whom are doing admirable work with insufficient training. The result is inevitable; largely grounded fleets, poor flight safety records, and poor reputations within the defense structure.”

In an interview with ADF at the Dakar symposium, Brig. Gen. Hermaalas Ndabashinze, chief of the Burundi Air Force, said that one of his biggest expenses is pilot training, usually in Europe. The Burundi Air Force is one of the smallest on the continent, but he said that maintaining his air fleet “is a common challenge” that most African air forces face. From buying spare parts from manufacturers to having an entire aircraft shipped to a manufacturer

for an overhaul, “it’s big money, it’s a challenge.”

Burgess wrote that, “in most cases, an air force would be best served operating no more than a few platforms with enough of each aircraft to maximize training and supply efficiencies.”

SUCCESS STORIES

Many air forces are changing their approach to buying aircraft. Some have concluded that they need smaller, less-expensive aircraft. Others have determined that they need to build sophisticated maintenance systems into their defense budgets.

BUILDING IN SUPPORT: Less than two years after the Nigerian Air Force added 12 A-29 Super Tucano light aircraft to its fleet, a \$38 million project to build new support facilities for the aircraft was completed at Kainji Air Base.

The base improvements were delivered in two main phases, with the first phase completed in 2021 to allow for the safe delivery of the first Super Tucanos. The small fighter planes have become a critical part of Nigeria’s war on the terrorist group Boko Haram and associated insurgents.



U.S. Air Force advisors work with Kenyan personnel in recovery, maintenance and flight training at Moi Air Force Base in Kenya.

STAFF SGT. DANIEL GARCIA/U.S. AIR FORCE

The U.S. Army Corps of Engineers oversaw the construction of the projects. Some of the major construction upgrades include the creation of a munition storage area with earth-covered ammo storage. The area also includes a munitions maintenance and assembly facility, a new taxiway and a cargo pad. The facility now includes mission planning and debriefing rooms and a battle aviation training device.

DefenceWeb reported that the Nigerian Air Force also awarded wings to six additional pilots on the Super Tucano, who constitute the last batch of a total 24 pilots trained to fly the A-29s.

REGIONAL MAINTENANCE CENTER: Morocco plans to become a military aircraft maintenance center for neighboring nations and has signed agreements with Belgian and U.S. companies for the maintenance and support of F-16 fighter jets and C-130 Hercules cargo planes. The agreements, according to Breaking Defense, are with Belgian companies Sabca and Sabena Aerospace, and Lockheed Martin of the U.S. Morocco signed the agreement on April 14, 2022.

Morocco “expects to maintain the F-16 and C-130 Hercules not only for its air force but also for neighboring African countries operating these aircraft,” Moroccan military expert Abdel Hamid Harfi told Breaking Defense.

Several countries in the region either already have, or are getting, C-130 planes. Tunisia has eight, with another two reportedly on the way. Chad, Egypt, Libya and Niger also use the C-130. Egypt has 220 F-16 fighter jets — one of the largest F-16 fleets in the world. Morocco reportedly has 23 F-16 jets and 12 C-130s.

The partnership includes the construction of a 15,000-square-meter maintenance, repair, overhaul and upgrade center for military aircraft and helicopters at Benslimane Airport. The facility will support up to 300 new jobs.

BUILDING AN OVERHAUL CENTER: In April 2023, Ugandan President Yoweri Museveni commissioned the country’s first locally overhauled Mi-24 combat helicopter. Military Africa reported that the National Enterprise Corp. (NEC), the production and commercial arm of the



Uganda Peoples' Defence Forces, performed the extensive overhaul.

Uganda, along with the NEC and Pro-Heli International, commissioned the helicopter maintenance, repair and overhaul plant at the Nakasongola Air Force Base. The Mi-24 is a key asset in Uganda's military arsenal and has been used extensively in counterinsurgency operations against rebel groups. The 2023 World Air Forces Directory reported that Uganda has five Mi-24s.

Military Africa reported that the overhaul involved a complete teardown, followed by an inspection and repair of all its components. Workers upgraded the helicopter's engines, avionics and weapons systems. Pilots took the finished helicopter on a series of test flights to ensure that it was fully operational and could meet the demands of its intended missions. Officials said the overhaul took 15 months, instead of the usual turnaround time for an outsourced overhaul of three years.

The helicopter received new dust filters, which could indicate foreign deployment in the future. It also was upgraded for day and night operations and for

deployment against cattle rustling and regional terrorism.

A month earlier, Uganda announced that 12 pilots for Mi-28NE attack helicopters and 52 maintenance engineers had completed an eight-month training course at Soroti Air Force Wing.

TRAINING INCLUDED: The Nigerien Air force officially added a third C-130 Hercules to its cargo fleet in a ceremony in early 2023. The package included maintenance training.

It is the final C-130 in a deal with the U.S. government, which delivered the first plane in January 2021. The website Military Africa reported that the package included training for 16 Nigerien pilots, 19 maintenance personnel, five baggage handlers and a flight engineer. Nigerien pilots trained in the United States, and the first female pilot in the Nigerien Air Force completed her six-month training in April 2020.

In January 2020, U.S. Africa Command handed over a new C-130 hangar worth \$7 million at Air Base 201 near Agadez, Niger. □



A Super Puma
helicopter

TIM FELCE

SUPER PUMAS JOIN BENIN'S AIR FORCE

DEFENCEWEB

Benin has added five helicopters — three H215 Super Pumas and two H125Ms — to its air fleet.

The helicopters will be used for counterterrorism in Benin's northwest, where 3,000 Soldiers are deployed to fight extremists as part of Operation Mirador, which began in 2022. Government troops, aircraft and armored vehicles have been deployed on the borders with Burkina Faso and Niger.

The Airbus H215 Super Puma originally was developed and built by the French aerospace company Aérospatiale. It is now built by Eurocopter and Airbus Helicopters. It is a medium-sized utility helicopter and is a larger version of the original Aérospatiale SA 330

Puma. The H125M, also known as the Fennec, is a light-weight multipurpose military helicopter manufactured by Airbus Helicopters.

The two H125Ms are fitted with Trakka Systems TC-300 long-range high-definition electro-optical/infrared cameras.

Benin's military previously received two AS550 Fennec helicopters in 2020, according to the Stockholm International Peace Research Institute. The air force has only a few serviceable aircraft in use, namely one Mi-8 helicopter, single DHC-6 and MA600 transports, a couple of Humbert Tétrás CSM light aircraft, and a BAe 748 transport.

In January 2023, Benin received eight Véhicule de l'Avant Blindé (VAB) armored vehicles from France for counterterrorism and other security tasks. Another seven equipped with machine guns in overhead turrets and night vision systems were expected.

In April 2023, the government announced the recruitment of 5,000 new Soldiers to step up the fight against terrorism.



A boat ramp and maintenance facility in Cotonou, Benin



A member of the U.S. Army Corps of Engineers measures the width of a newly constructed boat launch in Cotonou, Benin.

Benin Uses New Tools To Patrol Gulf of Guinea

ADF STAFF | PHOTOS BY CHRISTOPHER GARDNER, U.S. ARMY CORPS OF ENGINEERS

To help Benin combat piracy and other maritime crimes in the Gulf of Guinea, the U.S. government delivered a new patrol vessel to the country in December 2022. The U.S. also helped build a new boathouse, maintenance shop and launch ramp to accommodate the vessel.

Training was provided to the Beninese Special River and Maritime Police Unit (USPFM) through U.S. Africa Command.

“The Gulf of Guinea has some of the highest incidents of maritime piracy in the world, and prior to receiving the vessel and other aspects of the program, the maritime police had little capacity to patrol or interdict,” Matthew Briggs, deputy political-military affairs officer from the U.S. Embassy in Benin, said in a news release.

Officials delivered the boathouse and maintenance facility before the COVID-19 pandemic, and the USPFM has used the facilities to support its regular operations and maintenance needs. The new concrete launch replaces a gravel ramp that could not support the new vessel.

“These are really nice, modern facilities that we provided for launching and maintaining vessels,” Chris De Pooter, Europe district project engineer for the U.S. Army Corps of Engineers, said in the

release. “I think they will provide great benefits for the community as a whole. It’s a really good project, and I’m proud we could be a part of it.”

Although the region is considered a hot spot for piracy, the number of incidents has declined recently. Of the 90 global piracy and armed robbery incidents reported between January and September 2022, 13 were reported in the Gulf of Guinea, compared with 27 in the same period in 2021, according to the Geneva Centre for Security Policy.

The Gulf of Guinea also is considered a global hot spot for illegal, unreported and unregulated (IUU) fishing, which robs West Africa of an estimated \$2.3 billion to \$9.4 billion annually, decimates fish stocks and destroys ecosystems.

In 2021, Benin signed a pact with Ghana and Togo to work together to reduce IUU fishing.

In 2022, Benin became the first African nation to make its fishing fleet’s movements publicly visible through a deal with Global Fishing Watch (GFW). Under the agreement, Benin’s boats are tracked by a vessel monitoring system, and the country shares its data with GFW, which presents it on its online map.

Benin’s government is “committed to eradicating illegal fishing from our waters and taking all action necessary to secure sustainable fisheries,” Benin Minister for Agriculture, Livestock and Fisheries Gaston Cossi Dossouhoui told SeafoodSource.

Egypt Buying New Helicopters

ADF STAFF

The U.S. Army has awarded Boeing a contract to produce 12 new CH-47F Chinook helicopters for the Egyptian Air Force.

With the \$426 million purchase, Egypt will replace its fleet of CH-47D aircraft with the modern F model, which has advanced multimission technology.

“The F-model aircraft will enhance Egypt’s Chinook capabilities and help effectively accomplish its heavy-lift objectives,” said Ken Eland, Boeing vice president and H-47 program manager. “Boeing’s partnership with the Egyptian Air Force remains strong as we continue to work together to modernize their fleet.”

The first Chinook was introduced in 1962. The Boeing CH-47 Chinook is a tandem rotor helicopter developed by American rotorcraft company Vertol. It is a heavy-lift helicopter with a top speed of 310 kilometers per hour. It can carry up to 55 troops or up to 10 tons of mixed cargo. Its name, Chinook, is from the Native American



Soldiers disembark from an Egyptian Air Force CH-47 Chinook helicopter during a drill in 2021. AFP/GETTY IMAGES

Chinook people of the northwestern United States.

The CH-47F contains a fully integrated, digital cockpit management system, common avionics architecture system cockpit, and advanced cargo-handling capabilities complementing its mission performance and handling characteristics.

NIGERIA READY TO JUMP-START

HOMEGROWN MILITARY MANUFACTURING

ADF STAFF

Nigeria's National Agency for Science and Engineering Infrastructure (NASENI) is pushing to produce military weapons, vehicles and equipment that are "Made in Nigeria" to support the fight against extremist groups, bandits and other security threats.

Olusegun Ayeoyenikan, deputy director in charge of information at NASENI, said the Nigerian Army Corps of Electrical and Mechanical Engineers took on one of the first projects to produce a 12.7 mm anti-aircraft gun. Other projects will include armored personnel carriers, unmanned aerial vehicles and light weapons for military use.

"The Agency had begun collaboration with some indigenous industries and research institutions as well as some foreign original equipment manufacturers with a view to domesticating military weapons and equipment production in Nigeria through infrastructural development and transfer of technology," Ayeoyenikan said, according to Military Africa.

Another project that began in 2017 aims to create the first helicopter made in Nigeria. The country entered into an agreement with the Dynali Helicopter Co. in Belgium to produce the helicopters and transfer the technology so that

they can be built domestically.

In a January 2023 news conference to update the media on the helicopter project, military and civilian leaders said they plan to continue to work together to build a robust domestic defense industry.

"You can count on our 110% collaboration," said Air Vice Marshal Paul Jemitola, commandant of the Air Force Institute of Technology in Kaduna. "We are going to continue to collaborate in every dimension, shape and form because we are going to benefit as well."

Professor Mohammed Haruna, executive vice president of NASENI, said Nigeria's industrial growth will make the country more self-sufficient.

"The intention is to ensure that all major vehicles we use here, their spare parts shall be available here and the manufacturer of such vehicles should have a location here and produce spare parts here," Haruna told Channels Television.

Dignitaries including then-Nigerian Vice President Yemi Osinbajo, second from the right, lay the foundation for a solar cell production line in Gora in March 2023. Nigeria's National Agency for Science and Engineering Infrastructure is pushing to develop more products domestically. NASENI

Egyptian Company Touts NEW C5ISR SYSTEM AS SAFE, INTEROPERABLE

ADF STAFF

An Egyptian company has unveiled a domestically made command, control, communication, computers, cyber, intelligence, surveillance and reconnaissance (C5ISR) system. The system works with defense systems from around the world, an important attribute for countries such as Egypt that buy equipment from a variety of global manufacturers.

ACME SAICO presented the system at the International Defense Expo in Abu Dhabi, United Arab Emirates. According to the website Breaking Defense, Egypt has struggled to coordinate the operations of its defense systems since the 1970s because of their different origins. This includes aircraft, air defense systems, naval systems and others.

The new system is designed to solve that problem.

"C5ISR can deal with hybrid defense systems from different countries and following different protocols," Ziad Badawi, head of the company's Electronic Industries Division, told Breaking Defense.

C5ISR is an integrated system giving fighters on the battlefield and officers in the command center the ability to seamlessly communicate and access real-time information. According to the U.S. Army, the best C5ISR technology allows for "information dominance and decisive lethality for the networked Soldier."

In 2018, ACME SAICO produced a radar integration and surveillance command center that was later upgraded to perform combined missions with radars, missiles, aircraft, land forces and counter-terrorism, Badawi told Breaking Defense. The company has developed command centers for land and naval operations.

The company said its technology meets the highest standards of cybersecurity.

"We build our own cybersecurity system hardware base that doesn't need updates from the internet," he said. "The system is a closed cloud customer that the operator can control without the firm's technician's intervention. The firm only provides technology transfer for the integration parts, and the operator makes the integration."

ACME SAICO presented the C5ISR system at the International Defense Expo in Abu Dhabi, United Arab Emirates. MOMEN ESMAT



As internet use grows in West Africa, leaders are calling for better regional cooperation on cybersecurity. A joint approach can protect citizens, businesses, government institutions and critical infrastructure from online attacks, according to cybersecurity expert Folake Olagunju.

"It has to be a whole society approach," Olagunju said during a podcast interview with the EU International Partners Academy. Olagunju is the program officer for internet and cybersecurity at the Economic Community of West African States (ECOWAS).

Since 2019, internet use across West Africa has grown by about 25%. That growth has been unevenly distributed across the region, with a high of 62% of Cabo Verdean residents online to a low of 14.5% of Nigeriens.

Cybercriminals are capitalizing on the online growth. They use phishing to gain access to computer systems by sending legitimate-looking emails that contain software designed to invade computer networks or steal personal data. In ransomware attacks, hackers invade companies, such as banks, and lock out users until victims pay a ransom.

Continentwide, Africans experienced 10.7 million phishing attacks in the second quarter of 2022, according to industry data.

Through its Organised Crime: West African Response on Cybersecurity and Fight Against Cybercrime program, ECOWAS has trained law enforcement officials to confront cybercriminals and gather evidence to help prosecute them.

ECOWAS is helping member states modernize their telecommunications sectors to make them more resilient.

Part of the ECOWAS plan is to make sure West African countries are working along similar lines as they develop their cybersecurity plans so they can share information and build trust among themselves.

Olagunju suggests that the ECOWAS model could be replicated across the continent's other regional blocs, allowing leaders to tailor solutions to their unique cybersecurity problems.

"It might make more sense for countries in the same bloc to reach out to each other," she said. "It's no longer 'you versus me.' It's 'us.'"

The Economic Community of West African States is working to improve West Africa's cybersecurity by training enforcement officials and helping member states modernize their telecommunications sectors.



MARITIME FUSION CENTRE

Targets Sea Crimes

ADF STAFF

Authorities seized 3,000 rifles, hundreds of rounds of ammunition and antitank missiles from a fishing vessel in the Gulf of Oman on January 15, 2023. The Iranian weapons were destined for the Houthi militia in Yemen.

Eleven days earlier, officials intercepted 2,000 assorted Iranian weapons bound for Yemen on a fishing vessel in the same area, according to the Regional Maritime Information Fusion Centre (RMIFC) in Madagascar.

Without vessel information the center shared with local authorities, some of the weapons might have wound up in Somalia and sold to violent extremist groups such as al-Shabaab and the Islamic State in Somalia. Iran has used the country to funnel weapons to the Houthi militia since about 2016.

According to the RMIFC, weapons trafficking in the East and Southern Africa and Indian Ocean (ESA-IO) region is rising. The center combats the issue by sharing and exchanging maritime security information on vessels suspected of committing crimes.

The center helps identify suspicious vessels that could be connected to sea crimes such as drug smuggling, illegal migration and illegal fishing. Constant monitoring by the center's watch room helps it warn maritime law enforcement agencies of threats in a timely manner.

The January arrests "not only highlight that the use of fishing vessels and dhows continue to aid the activities of criminals, but the active existence of known smuggling and trafficking routes is also contributing to the illegal trade," Lt. Saïd Lavani, Comoros international liaison officer at the RMIFC, told ADF in an email. "The

AK-47 assault weapons trafficked by Iran and intended to arm Houthi rebels in Yemen are displayed aboard a U.S. vessel.

U.S. CENTRAL COMMAND

lack of detention of suspected criminals intercepted at sea is also allowing the networks and smuggling runs to thrive."

The RMIFC shares information with its sister center, the Regional Centre for Operational Coordination (RCOC) in the Seychelles, and with any country that faces a maritime threat. If the country is not able to interdict, it can request help from the RCOC.

The frequent weapons seizures underline a "worrying threat in the region," according to Lavani, who recommended that all countries in the region join the architecture of the Maritime Security Programme (MASE) so they can receive information from the regional centers. MASE is funded by the European Union and led in the ESA-IO region by the Indian Ocean Commission.

Comoros, Djibouti, France on behalf of Réunion island, Kenya, Madagascar, Mauritius and the Seychelles are MASE members. Lavani said Tanzania is likely to join soon.

A report by the Institute for Security Studies revealed that the Iranian weapons smuggling network likely extends to groups linked to al-Shabaab in Ethiopia, Kenya and Mozambique. Iranian weapons also end up in the Central African Republic, South Sudan and Tanzania.

Iran also has confirmed links with many drug-smuggling networks around the Horn of Africa, according to Abdul Salam Mohammed, head of the Abaad Studies & Research Center in Yemen.



G5 SAHEL DEFENSE COLLEGE EXPANDS AS 'EXPORTER OF REGIONAL SECURITY'

ADF STAFF

Groundbreaking began on new facilities at the G5 Sahel Defense College on February 14, 2023, in Nouakchott, Mauritania. Once complete, the addition will include an expanded library, classroom space, a 20-seat language learning lab, and computers and audio translation equipment. The \$5 million project funded by the U.S. government is expected to take one year to complete.

"The library will be a physical symbol of two important roles of the college: as a provider of professional military education and as an exporter of regional security," said U.S. Ambassador to Mauritania Cynthia Kierscht. "Truly, the library reflects the long and enduring commitment of the United States to work with Mauritania to advance peace and security in the Sahel."

The G5 Sahel Defense College gets its name from the G5 Sahel, a coalition created in 2014 to respond to regional challenges from a united political security and development perspective. When created, the G5 Sahel consisted of Burkina Faso, Chad, Mali, Mauritania and Niger.

The G5 Sahel Defense College has evolved into a true regional project. It has a simulation center capable of putting trainees in field situations and is interconnected with the G5 East and West centers with which it can have simultaneous exercises.

The college trains 40 officer cadets from West African armies each year. It also is open to officers from outside the Sahel.

Brig. Gen. Brahim Vall Cheibani Cheikh Ahmed, director of the college, says it is imperative to gather armed forces executives of the G5 around the same training module.

"The G5 Sahel is based on two pillars: a development pillar and a defense and security pillar," the general said, as reported by Africanews. "The armies of the G5 countries being confronted with the same threat, it was judicious that the executives who command the forces on the ground underwent the same training and the same vision of the threat, and the same methodological approach, and the same work processes because tomorrow, at the end of the day, they will find themselves in the same theater working to face the same enemy."

U.S. Ambassador Cynthia Kierscht, center, Mauritanian Minister of Defence Hanena Ould Sidi, center right, and other dignitaries attended a groundbreaking ceremony for a library at the G5 Sahel Defense College.

U.S. EMBASSY MAURITANIA

TANZANIA DEPLOYS WARSHIP TO PATROL MOZAMBIQUE CHANNEL

ADF STAFF

The Tanzania Navy deployed a vessel in the Mozambique Channel to help the Southern African Development Community (SADC) and international partners address an array of sea crimes, including illegal fishing, drug smuggling, oil theft, and human and weapons trafficking.

Although piracy has declined in the region, limited maritime security along the channel leaves coastal cities and island states vulnerable to maritime threats.

The channel, a 1,600-kilometer-long waterway between Madagascar and East Africa that carries about 30% of global tanker traffic, is a major route for drug, weapons and human trafficking, illicit trades that are widely believed to help fund terrorist groups in the region.

The Tanzania Navy vessel joins three South African warships in the channel, and those of international allies. Officials announced its deployment at the SADC's annual Standing Maritime Committee meeting in March 2023.

At the SADC gathering, Vice Adm. Monde Lobese, chief of the South African Navy, said the region's navies "must ensure that there are no threats posed to the free flow of trade."

"I don't have to remind our land-locked brothers of SADC that even their commerce and trade flows through the harbors of their coastal neighbors," Lobese said in a report by South African news website Independent Online.



An 8-meter defender-class boat operated by the Tanzania Navy is shown. The navy is deploying a vessel in the Mozambique Channel to help combat regional sea crimes.

TANZANIA NAVAL COMMAND

Senior naval representatives from Botswana, the Democratic Republic of the Congo, Namibia, South Africa, Tanzania and Zimbabwe attended the meeting.

Members worked on the SADC's integrated maritime security strategy, which will help member states respond to emergencies or issues that threaten sovereignty. South Africa will host a course for regional representatives on "naval coordination and guidance of shipping" that helps navies monitor shipping in their waters. The South African Navy plans a train-the-trainer course on the same topic.

Naval leaders say the training increased regional partnerships, will lead to safer shipping and protect economic growth.

"The peace and stability of the entire SADC region is intricately related to our ability to reduce threats to our maritime security," Lobese said.

A member of the U.N.'s all-female search and detect team responsible for identifying improvised explosive devices in Mali HARANDANE DICKO/MINUSMA

Women's Unit BREAKS NEW GROUND IN MALI

U.N. PEACEKEEPING

The Egyptian Formed Police Unit, deployed in Douentza, Mali, as part of the U.N. mission (MINUSMA) in 2017, set up three teams to tackle the threat of improvised explosive devices (IED). One of them was composed entirely of female police officers and was the first such search and detect team deployed in a U.N. peace operation.

The teams are trained to identify IEDs so that ordnance disposal experts can safely remove them.

The Douentza team worked close to dirt roads used by civilians who often are targeted by terrorists and armed groups. From 2020 to 2021, the country recorded the second-largest increase in terrorism-related civilian and peacekeeper deaths, according to the Global Terrorism Index. The U.N. Security Council voted to end the mission, and most personnel were expected to leave by the end of 2023.

Once a task order is released, every second counts. If the team does not find an IED or land mine, then the safety and security of a convoy can be at risk. Maj. Doaa Moussa, team commander, is aware of this: "This team must protect the peacekeepers, but also the civilians. It's a heavy responsibility."

As team members moved to the armory to pick up weapons and detection equipment, Lt. Col. Ibrahim Rady gave final instructions before going to the affected site. Once they arrived, the team identified and defused a land mine.

This time, it was an exercise to ensure that the team is prepared for real risks. Since 2013, the number of attacks on peacekeepers in Mali has grown six times, from two IED-related incidents in October 2013 to 12 in 2022. There were 19 incidents in 2014 and 15 in 2021.

Since its deployment in 2013, MINUSMA lost 162 military peacekeepers to land mines and other hostile acts. Troops and convoys that frequently moved through the Malian territory to protect civilians often were targets of IEDs, particularly in northern and central regions.

"We are very proud to be the first women to be trained on IED threat mitigation," said Capt. Rana Ghourab. "It is a tool that will help us a lot in empowering women in Egypt and the Middle East. This experience will also help us show that [women] can do anything that [men] can do."



DRC Mission Uses PORTABLE SURGICAL UNIT

U.N. PEACEKEEPING

To fulfill their mandate of protecting civilians, peacekeepers serving with the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO) often face danger in remote areas, with limited access to medical services. A light mobile surgical module deployed with the Malawi Battalion has significantly improved the safety and security of peacekeepers.

Operating 24 hours a day, the light mobile surgical module has a static and mobile component run by 31 peacekeepers. The static component works as a referral medical center for Level 1 hospitals and has an operating theater, emergency area, radiology, laboratory, pharmacy and intensive care unit. The mobile component is a van equipped with a surgical theater and state-of-the-art equipment that travels with troops in hard-to-reach areas. It began operations in May 2022.

According to the World Health Organization, telemedicine is “healing from a distance.” In the field, when peacekeepers and partners have medical emergencies, it is an excellent way for surgeons to support a medical officer without being physically present.

“Ninety percent of people die in combat due to profuse bleeding,” said Capt. Tadziana Kapeni. “This facility is always closer to the troops.”

When evacuation is not possible after a peacekeeper has been injured, medics in the mobile module can provide immediate surgical resuscitative measures before the patient is transferred to a higher level of care.

During intense fighting in Kiwanja in eastern DRC, three Moroccan Soldiers serving with MONUSCO sustained life-threatening injuries. The mobile surgical team provided immediate resuscitation and surgery while under fire. Without their presence, the patients would have died within hours as evacuation was not possible amid ongoing fire in a no-fly zone.

“This technology is a force multiplier and should be integrated in modern day combat medical care even in the civilian context,” said Lt. Col. Phillip Chitekwe, commanding officer from the Malawi Battalion. “I believe peace is possible, and it begins with all of us as peacemakers.”

Health care workers prepare to operate on a patient inside the light mobile surgical module.

MONUSCO

STUDIES: U.N. MISSIONS PROVE TO BE SUCCESSFUL

THE UNITED NATIONS

Failures of United Nations peacekeeping missions have been highly publicized, but recent studies show reason for optimism.

The evidence, collected in 16 peer-reviewed studies, shows that peacekeepers significantly reduce civilian casualties, shorten conflicts and help make peace agreements stick. In fact, the majority of U.N. peacekeeping missions succeed in their primary goal, which is stabilizing societies and ending war.

“If we look systematically across the record, most of the time peacekeeping works.” That’s the verdict of Professor Lise Howard of Georgetown University. Her book, “Power in Peacekeeping,” is based on extensive field research across different U.N. missions.

“If we look at the completed missions since the end of the Cold War, two-thirds of the time, peacekeepers have been successful at implementing their mandates and departing,” Howard said in an interview with U.N. Video. “That’s not to say that in all of those cases everything is perfect in the countries. But it is to say that they’re no longer at war.”

Howard said millions of lives have been spared since the creation of peacekeeping in 1948. The idea of using Soldiers to help keep the peace was born during negotiations in the Middle East in 1948, when the newly founded state of Israel was in conflict with its neighbors.

One of Howard’s case studies is Namibia. In 1989, a U.N. peacekeeping mission helped end a civil war and supported the first free and fair elections in the country’s history. That was far from easy.

“Namibia is a country that has experienced tremendous hardship,” Howard said. “It’s had multiple colonial rulers. It had a genocide. It’s been victim of a regional war, of civil war. But surprisingly, Namibia has not fallen victim to this tremendously difficult history.”

Today, Namibia is a stable, upper middle-income country, with a functioning democratic system — an extraordinary achievement, given its historical background.

The U.N. mission in Namibia was innovative for its time. Women made up 40% of its personnel. Howard said U.N. peacekeeping is most effective when it does not rely simply on force of arms.

Howard argues that U.N. peacekeeping is most successful when using persuasion and inducement, rather than military force. But whatever the strategy behind the success, the data from extensive studies shows that the peacekeeping missions are effective much of the time.

“If we look systematically across the cases, peacekeepers are helping people, in their everyday lives, move from a situation where there’s war and violent conflict to a situation where there is more peace.”

United Nations peacekeepers from Rwanda patrol outside Bangui, Central African Republic. THE ASSOCIATED PRESS





GUINEA, INDONESIA EXPLORE AVIATION COOPERATION

ADF STAFF

Indonesian Transport Minister Budi Karya Sumadi and his Guinean counterpart Felix Lamah have signed a letter of intent, the first step in the two countries' commitment to explore cooperation in the aviation sector. It is an unusual proposition, as the two countries are 13,700 kilometers apart.

The initial idea for the cooperation came in September 2022, according to aerospace newsletter *The Bulletin*. Guinea acknowledged its need to modernize its commercial and transport sector and expressed interest in cooperating with Indonesia.

In a written statement, the Indonesian transport minister said that after receiving the Guinean transport minister in Jakarta, "We are open to this opportunity and ready to cooperate with the Guinean government," *The Bulletin* reported.

Guinea's President Mamadi Doumbouya wants to create a national airline, Guinea Air. This would replace the failed project of private Guinea Airlines, which launched in 2017. It was canceled in 2021 because of the poor condition of Guinea's airfields and disputes between the main shareholders.

Guinea wants to use aircraft made by state-owned PT Dirgantara Indonesia. *The Bulletin* reported that Guinea would like at least 13 of the civil version of the CN-235 aircraft to operate more than 80 routes in Guinea and West Africa.

The CN-235 has been produced under license by the Indonesian facility since 2011 via an industrial collaboration with Spanish CASA, later integrated into Airbus Defence & Space.

CABO VERDE WELCOMES AFRICAN MARITIME FORCES SUMMIT

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African maritime leaders joined their international counterparts in Sal Island, Cabo Verde, for the first African Maritime Forces Summit.

The three-day summit in March 2023 was co-hosted by the Commander of U.S. Naval Forces Europe-Africa, Adm. Stuart B. Munsch. It brought together heads of navies, coast guards and naval infantries from 38 nations to discuss strategic and operational approaches to maritime security.

"The security dynamics impacting African nations are shaping our present, and they will shape our future. Partnership can serve as the foundation to stability in Africa and growing prosperity for every African nation," Munsch said. "This week we had the opportunity to strengthen our existing partnerships and also build new ones, ready to meet shared challenges together."



Military leaders attending the African Maritime Forces Summit stand in front of the USS Bulkeley in Sal Island, Cabo Verde.

LANCE CPL. MARY LINNIMAN/U.S. MARINE CORPS

Panel sessions included discussions on strategic and operational approaches to maritime security, maritime threat response through naval infantry, shared challenges within respective maritime services, and regional interoperability initiatives.

The summit also included a visit to the Arleigh Burke-class guided-missile destroyer USS Bulkeley to observe shipboard firefighting demonstrations, joint U.S. Coast Guard and Cabo Verdean boarding drills, and simulated bomb-disposal robotics conducted by U.S. Marines.

Cabo Verde's Chief of Defense Rear Adm. António Duarte Monteiro's closing remarks emphasized the importance of cooperation among regional and international partners.

"Threats to maritime security do not respect political boundaries, and there is very little that an individual state can do alone," Monteiro said. "The need to cooperate with others is fundamental to the very concept of increased maritime security and sustainable development of the blue economy. Cooperation with other states in security, law enforcement and the protection of the environment should not be viewed as a derogation of sovereignty, but rather as a multiplication of the effectiveness of our sovereignty."



Medical Services Offered to Remote Kenyan Communities

ADF STAFF

Medical personnel from the Kenya Defence Forces and the U.S. Army concluded a two-day medical civic action program in Samburu County, Kenya, as part of humanitarian assistance efforts during exercise Justified Accord 2023.

It marked the latest in a series of combined force medical outreaches between the two countries.

"This is really a culmination of all the previous engagements, to improve upon them and continue to broaden and strengthen the relationships already forged," said U.S. Army Lt. Col. Rhonda Dyer, a public health nurse. "The relationships already existed with individual nations, but this exercise has brought all the partners together."

Officials staged the program, also known as a MEDCAP, during U.S. Africa Command's largest military exercise in East Africa. U.S. Army Southern European Task Force, Africa leads the exercise, which includes nearly 1,000 participants from 20 nations representing four continents. The exercise's purpose is to support regional security, crisis response and humanitarian assistance.

Day 1 at Archer's Post Sub-County Hospital brought more than 300 patients, mostly with gastrointestinal and musculoskeletal issues, and some snakebites with infections.

"We were able to treat all of those," Dyer said. "But probably the highlight of that day was when a pregnant patient visited the clinic, and the staff was able to assist with the baby's delivery within minutes of her arrival."

Most patients who visited the clinic brought multiple children with them, some of whom tagged along with military camera crews and assisted with taking photos while family members received medical treatment.

The second day of the program took place at Larisoro Dispensary in Kalama, where Kenyan and U.S. Army medics treated more than 450 patients. The dispensary serves as a maternity ward, and the combined team provided free medical services such as blood pressure and diabetes screenings, laboratory tests, and prescriptions against various diseases.



Aloise Lekupe, Kenyan officer in charge of the Larisoro Dispensary, said, "Personally, I prefer that these joint medical programs would be more frequent. Most of the people in this area live below the poverty level. So when they need medical services, they just stay home. They use what little money they earn just to put food on the table. Medical services are a luxury for them."

Kenyan patients wait to be seen during a free clinic hosted in Archer's Post, Kenya. The Kenya Defence Forces and the U.S. Army conducted the clinic.

INSET: Kenyan children look through a camera during a medical civic action program in Archer's Post.

CPL. GENESIS MIRANDA/U.S. ARMY

Dihya, the Berber Queen of North Africa

ADF STAFF

In the seventh century, Islam began spreading from the Arabian Peninsula west to what is now Spain, and east to northern India. The religion and its political power spread through traders, pilgrims and missionaries.

It also spread through military conquests, with armies overwhelming vast territories and establishing imperial outposts. Most of this expansion came during the reign of the Rashidun Caliphate, the first four successors of Muhammad, from 632 to 661.

Conquering tribes also set their sights on North Africa. That is when they encountered Dihya, the Berber queen who lived in the mountains of what is now Algeria. She pushed back.

For a time, the Berbers, sometimes referred to as “the natives of North Africa,” were under the control of the Exarchate of Carthage, which was part of the Byzantine Empire. After Arabs conquered Egypt, the Exarchate became one of their next targets. The Byzantine capital of Carthage subsequently fell to the armies of Hasan ibn al-Nu‘man of the Umayyad dynasty, ending Byzantine control of the area.

With their former leaders gone, what remained of the Berbers became small tribal pockets of resistance — the only such opponents to Arab rule in Africa at that time. The scattered Berbers united around Dihya, who proved to be a worthy leader, eventually building a powerful army.

She was commonly known as the “Kahina,” meaning “seer” in Arabic. She was said to have the ability to see into the future.

Almost everything about her is a mystery. For political reasons, “facts” about her were invented and

reinvented after her death, particularly in the ninth century. The exact dates of her birth, her rule and her death are unknown. She is believed to have come to power in the 680s. Historians have linked her to three different tribes, and even her parents are a source of dispute.



This statue of Queen Dihya is in the town of Baghai, Khenchela Province, Algeria.

She is believed to have had three sons, one of them adopted. One story claims that as a young woman, she freed her people by agreeing to marry a tyrant, and then murdering him on her wedding night. But almost nothing

is known for sure, not even what she looked like. One account said she was 127 when she died.

But she was a powerful queen, and Hasan, the general of the Arab army, would not tolerate her resistance. He came after her, and in 698, their armies met in the Battle of Meskiana, or “the battle of camels,” where the Berber Queen easily defeated him. Hasan was forced to flee and eventually settled in what is now Libya for about five years.

Dihya knew that her powerful enemy eventually would come back. Most historians believe that she began a scorched earth campaign to destroy anything in her empire that might be of use to an advancing enemy. The campaign had little impact on the mountain and desert tribes, but devastated her tribesmen who lived in the vulnerable oases.

In destroying some of the villages and strongholds within her kingdom, she turned her own people against her. Hassan knew this and returned with his army. This time, he was the victor in the Battle of Tabarka, in what is now Tunisia and Algeria.

Legends say she died in battle, while others claim that she took poison to avoid capture. Regardless of how she died, her corpse was beheaded, with the head sent to Damascus as proof of her death.

Today, she is seen as a shining example of feminism. But her memory has been manipulated many times over the centuries as a symbol of Berber heroism and independence.

All we know for sure is that she was, for a time, a great and powerful queen.



CLUES

- 1 This site includes a royal city, burial grounds and other sacred places, and remains an important historic and spiritual location.
- 2 It includes a system of fortifications with a series of ditches and 14 stone gateways.
- 3 It was used as a royal palace and political capital during the reign of Andriantsimitoviaminiandriana Andriandrazaka in the 1700s.
- 4 In times of danger, a huge stone disk was rolled in front of the main gate to seal it.



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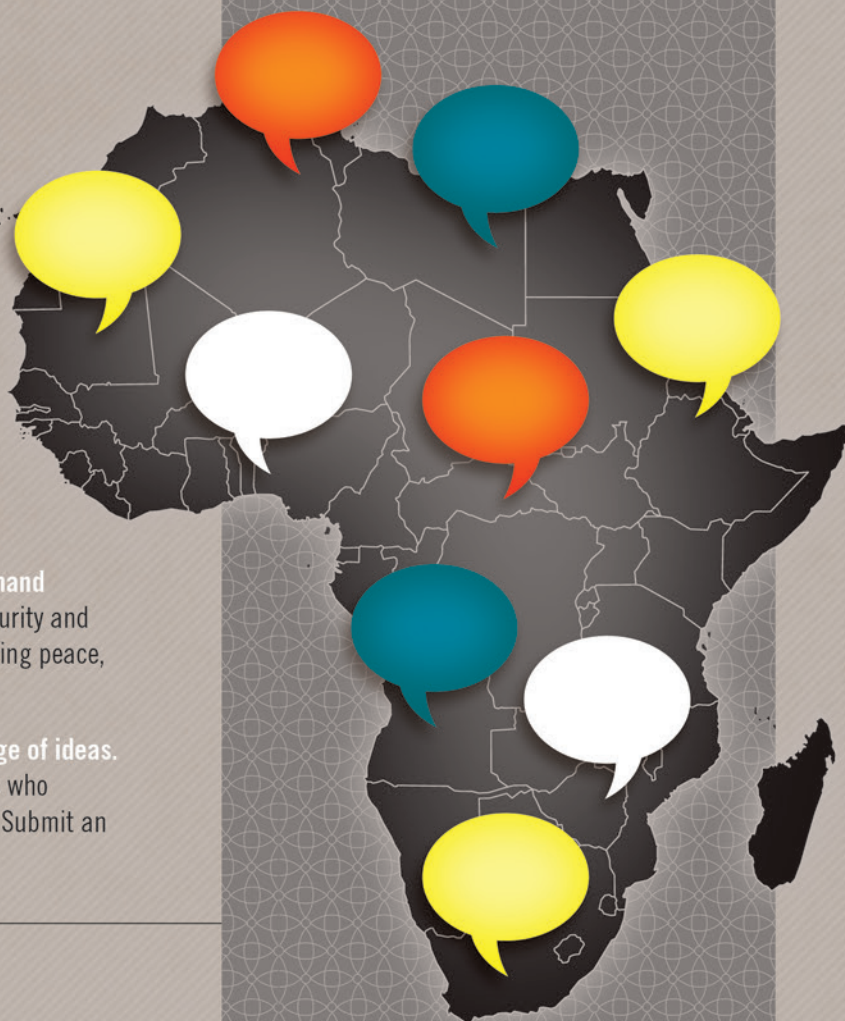
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