Space Support for African Maritime Strategies

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Out of the 54 countries in Africa, at least 32 are littoral states, sharing boundaries with the Atlantic and Indian Oceans, as well as the Mediterranean and Red Seas. In addition, Africa is blessed with several internal and international rivers, lakes, deltas and lagoons. Collectively, these maritime spaces provide critical routes for trade and sources of food and natural resources, such as diamonds, gas, oil, phosphate, titanium and zirconium. It was recently reported that the blue economy accounted for about $300 billion - 10 per cent - of economic activities in Africa, and supported 50 million jobs. Nevertheless, the potential of the African maritime domain has been undermined by the absence and most recently inadequate policy attention, political commitments and institutional capabilities to effectively govern this frontier of development. Hence, the continent has become infamous for maritime piracy and robbery, illegal, unreported and unregulated (IUU) fishing, toxic dumping, oil spillage and gas flaring, human, drug and arms trafficking, militancy and armed conflicts. These, among others, have raised the overriding need for African strategies, which accommodate space and other technologies in maritime governance, development and security.

Space in African Maritime Strategies

There has been growing attention to the development potential of African maritime domains and their challenges in recent years. In addition to different national and sub-regional initiatives, the African Union (AU) has developed a regional agenda that prioritises maritime and space strategies. Adopted in 2015, the AU's Agenda 2063 (specifically no. 63, aspiration 7) states: "We aspire that by 2063, Africa shall be: A major social, political and economic force in the world, with her rightful share of the global commons (land, oceans and space)". In 2016, the African Charter on Maritime Security and Safety and Development in Africa (Lomé Charter) was adopted. Article 30 (3) of the Charter noted that "State Parties shall cooperate at national, regional and continental levels, in: harnessing state of the art technologies, in conformity with the

African Space Policy and Strategy and other relevant instruments for maritime security and safety".

One of the benefits of space science and technologies that received attention in African Space Policy is how "earth observation/remote-sensing satellites use state-of-the-art instruments to gather information about the natural resources and the condition of Earth's interrelated land, sea, and atmospheric systems". Accordingly, one of the two goals of the African Space Strategy that was published in 2019 is thus "space-derived products and services used for decision-making and addressing economic, political, social and environmental challenges." This strategy recognises 11 other African strategies and prioritises societal needs, including food security, water resources, marine and coastal zones, environment, weather and climate, security and disaster response, health planning, governance and commerce, infrastructure, information and communication, and innovation. These, among others, show the desire of African states to collaborate in annexing the potential of space technologies in advancing their maritime governance, development and security in the region.

Space strategy is indispensable in Africa's Integrated Maritime Strategy (2050 AIM strategy), of which three out of its four building blocks for capacity and capability require space support. The AIM strategy prioritises (1) Maritime Defense Architecture that includes interoperable Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) architecture, (2) Maritime infrastructure, such as command centers, aids to navigation and hydrography infrastructure and facilities, and C4ISR infrastructure, (3) Maritime surveillance and response capabilities such as patrol vessels and operational equipment, command and control, operational procedure, sub-regional and cross-country interoperability.

African Space Strategies and Capabilities

African space strategy is premised on six strategic actions, including addressing user needs, accessing space services, developing regional and international market, adopting good governance and management, coordinating regional space arena, and promoting international cooperation. For these purposes, international space service providers have flourished in the continent since the dawn of the space age, and in the last three decades, many African countries have developed space capabilities, which the AU is trying to tap into and harmonize for regional development.

Africa has increasingly developed institutional capacities, space-based capabilities and related ground facilities and infrastructures. About 30 African countries have initiated space programs and established dedicated institutions. Egypt sponsored Africa's first satellite company in 1996 and orbited satellite in 1998, followed by South Africa in 1999. The same year, Nigeria launched the first space agency in Africa. In 2014, South Africa orbited first military satellite and Nigeria launched first military space agency in

Africa. In early 2024, 60 African satellites have been orbited and about 100 are in different stages of production. Over 68 per cent of those in orbit were sponsored and operated by Egypt (14), South Africa (12), Nigeria (7) and Algeria (6). Other satellites were orbited by Angola, Ethiopia, Ghana, Kenya, Mauritius, Rwanda, Sudan, Tunisia, Uganda, Zimbabwe and the Regional African Satellite Communication Organization (RASCOM). Africa is home to over 300 space companies, 355 ground stations, 60 telescopes, 22 planetariums and 11 observatories and eight launch facilities. Its space economy is projected to grow by 16.16% to USD 22.64 billion by 2026. These, among other things, inspired the formation of the African Space Agency (ASA), with headquarters in Egypt, tasked to harmonize the region's capabilities and potentials in space.

Space Support for African Maritime Strategies

African space strategies and capabilities have contributed to maritime domain awareness (MDA), which has advanced socio-economic, political and security aspirations of the region in this domain. Considering Africa's lack of navigation and positioning satellite, many countries in the region have collaborated with leading space players and associated companies, through the hosting of ground stations and receivers that enable effective use of American GPS, Russian GLONASS, European Galileo, Chinese BeiDou and perhaps Indian RNSS. These are important for effective navigation by ships and aircraft across fast maritime spaces, including around the continent. In addition to ground and sea-platform-based radar systems, navigation satellite systems provide critical space support for maritime traffic monitoring and management by port authorities and other stakeholders in ocean governance. Accordingly, the African dream of becoming an important global player in the blue economy cannot be realized outside space-supported navigation and maritime traffic management.

Earth observatory (EO) satellites now provide consistent if not permanent eyes on the seas, while communication satellites offer reliable offshore ears. While relying on international collaboration and markets for such services, Africa has increasingly developed space capabilities in these areas. The aforementioned 15 African countries have sponsored and operated EO satellites of different size, capacity, and endurance. These satellites have been used for food, water and environmental security surveys as well as maritime mapping to support policy decisions on maritime transport, trade, weather and disaster management. Hence, space capabilities have generally improved the MDA of many African countries. However, South Africa is the only country in the region that has orbited dedicated satellites for maritime purposes with ZaCube-1 & 2 (2013 and 2018, respectively) and MDASat-1A, B & C constellation in 2022. Equally, Algeria, Angola, Egypt, Nigeria and South Africa have sponsored communications satellites, which have contributed to space support for onshore and offshore connectivity in the region and beyond.

A growing number of African countries have developed military space strategies, programs and capabilities, including in maritime security. Prominently, South Africa (2014), Morocco (2017 and 2018), Egypt (2019) and Nigeria (2023) have orbited dedicated military or dual-use satellites to boost C4ISR capabilities and operational performance, with maritime effects. Accordingly, space support for maritime strategies is evident in Egypt's approaches to security in the Mediterranean and Red Seas, and along the River Nile, especially over the Ethiopian Dam crisis; Morocco's strategic posture over disputed territory with Spain; Nigeria's war against maritime militancy, piracy and other criminalities in the Gulf of Guinea; and South Africa's naval policing against IUU fishing.

Conclusion

The maritime domain has become an indispensable frontier to pursue development and security aspirations of African peoples and governments. However, its development potentials have been underexplored and undermined by inadequate policy attention, political commitment and state-regional institutional capacity. To address these and other challenges, Africa has developed maritime strategies that recognise the importance of space and related technologies. Space technologies are relevant to the advancement of African maritime strategies, although the potentials are currently undermined by inadequate commitment, capacity and capability. Consequently, more attention and commitment is required to relevant policies and strategies to boost national and regional capacities, capabilities, coordination, utilisation, management and governance of African maritime domains with space support. Importantly, regional cooperation is an underestimated key to maximise benefits with minimum financial cost in space support for maritime strategies in Africa.

This op-ed was compiled by Dr. Samuel Oyewole within the context of the Ocean Regions Research Programme of the Department of Political Sciences, University of Pretoria and is based on his recently published monograph, *Utilitarianism in Outer Space: Space Policies, Socioeconomic Development and Security Strategies in Nigeria and South Africa* (Springer, 2024). The opinions and findings expressed in this Report are those of the author(s) and the NIHSS accepts no liability in this regard.

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