

# Space Economy Initiative

Insights Report 2021

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UNITED NATIONS  
Office for Outer Space Affairs

## INTRODUCING THE **SPACE ECONOMY**

Estimates indicate the global space economy grew to \$447 billion in 2020<sup>1</sup>. Space and satellite technology are pillars of modern society. They provide policymakers with invaluable data and information, helping make effective fact-based decisions across a range of policy areas - from urbanization to national crisis response, with the COVID-19 pandemic being the most recent example of 'space-enabled' policy decisions being made at scale.

Expanding the global space economy, responsibly and sustainably, is a fundamental driver behind efforts to bring the benefits of space to everyone, everywhere. Further, these developments can support countries in efforts to "build back better" using space services to face policy challenges, while contributing to innovation, job and revenues creation.

Around the world, many space activities at the national level include a role for a publicly funded space agency or similar institution. This central public entity is often also part of a much broader stakeholder ecosystem including both private and other public sector entities, all contributing to the national space sector. Moreover, to truly identify and realize the socio-economic benefits of a strong space sector, we must look beyond just the immediate context; from agriculture to finance, from education to transport, space is making tangible contributions across a huge range of fields.

At the United Nations Office for Outer Space Affairs (UNOOSA), "Space Economy" is a concept that captures, in the broadest sense, the role space is playing to support sustainable socio-economic development. Unpacking such a complex picture is what we aim to achieve with the Space Economy Initiative. We seek to spotlight insights, success stories and experiences from across the international space community. We want to identify the key elements of growing healthy, prosperous space economies and then share such building blocks with all stakeholders pursuing responsible and sustainable space economy growth.

## SPACE ECONOMY: **AFRICA IN FOCUS**

After the success of the initial Space Economy [series of online events](#), UNOOSA organized a one-day virtual conference dedicated to enhancing growth of the commercial space sector in Africa on 30 June 2021 . The continent harbors a vibrant space economy with a projected growth exceeding \$10 billion by 2024<sup>2</sup>. The establishment of national space programs, agencies and strategies together with private sector companies will see further space applications, services and activities emerge. In the meantime, foreign investors are being drawn into the market of the second-most populous continent that promises an increase of demand, in particular in the fast-growing segments of telecommunication, agriculture, health and climate.

The "Space Economy: Africa in Focus" event provided a unique platform, first of its kind at the UN level, that brought together 12 representatives of the commercial space sector with

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<sup>1</sup> ["The Space Report 2021 Q2"](#), Space Foundation, 2021

<sup>2</sup> ["2020 African Space Industry Report"](#), Space in Africa, 2020

operations in Africa to discuss how to grow strong, responsible and sustainable space economies in the continent. The conference was organized with the support of the African Union and the Portuguese presidency of the European Union. More than 300 participants from 66 countries registered for the two sessions.

After introductory remarks by high-level representatives from UNOOSA, the African Union and Portugal, two panels gathered stakeholders from the private space sector operating in Africa. Experts gave remarks on their experience in the field before switching into a moderated discussion, engaging in a peer-to-peer exchange of good practices, lessons learned and outlook projections to connect, learn from each other and foster space economic growth.

This insights report captures the remarks and experiences shared during the conference from the following speakers.

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The recording of the event is available online and can be viewed here: [Session I](#), [Session II](#).



## I. INTRODUCTORY REMARKS

### **Simonetta Di Pippo**

Director of the United Nations Office for Outer Space Affairs

*Simonetta Di Pippo has been Director of the UN Office for Outer Space Affairs since 2014. Prior to joining UNOOSA, she served as Director of Human Spaceflight at the European Space Agency and as Director of the Observation of the Universe at the Italian National Space Agency. She is an Academician of IAA and a member of WEF Global Future Council on Space Technologies since 2016 and its co-chair since 2020.*

Welcoming the speakers and the audience, Director Di Pippo emphasized the importance of the virtual get-together: “this event marks a unique opportunity at UN level (..) Gathering African and non-African space sector stakeholders enables discussion around growth of the commercial space sector to foster inclusive and sustainable development in African countries”.

Director Di Pippo stressed that space is not a new sector for the continent. In 1820, the South African Astronomical Observatory was created to calculate the first distant measurement to the nearest star. In 1998, Egypt launched the first African satellite into outer space. Since then, over 40 satellites have been launched by African countries, with more than half only in the past 5 years.

The African space sector has seen exponential growth in the past decade, with more governmental and commercial actors boosting investments and getting involved in developing satellite-enabled services. This trend will continue as the new space ecosystem will bring new solutions and promising applications in e.g. tele-health and communications. Director Di Pippo underlined the impact that a strong space sector can have on the socio-economic development and that the space industry will be central in advancing the SDGs in a post-pandemic world. Director Di Pippo welcomed the development of an African-wide space policy and strategy, as well as the establishment of an African Space Agency. She also reminded that a one size fits all approach will not work on a continent that stretches over 54 countries with different needs and priorities.

As highlighted by Director Di Pippo, the UN has a tradition in engaging with and supporting African countries through capacity-building activities: for example, UNOOSA’s and JAXA’s joint KiboCUBE program provided Kenya and Mauritius the opportunity to deploy CubeSats from the ISS in 2018 and 2021 respectively. Additionally, through UN-SPIDER (the UN Space-based Information Platform for Disaster and Emergency Response), the UN works with governments to better integrate space solutions into decision-making and to improve access to information in case of emergencies, such as the support provided to Tunisia, Nigeria, Niger and Mozambique during floods and draught in 2020.

Director Di Pippo concluded by emphasizing that it will take joint cooperation efforts between stakeholders from the public and private sector to create an enabling environment for the development and sustainable growth of national space economies in Africa.

## **Mahama Ouedraogo**

Director of Education, Science, Technology and Innovation at the African Union

*Mahama Ouedraogo is the Director of Science and Technology Division of the African Union. In this capacity, he oversees the implementation of various African Union decisions on Science and Technology, including the Science Technology and Innovation strategy for Africa (STISA-2024), the African Space Policy and Strategy, and the Pan-African University.*

In his opening statement, Director Ouedraogo presented the vibrant space ecosystem in Africa that has seen significant level of growth in the past decade driven by the innovative young population. "Space is not new in Africa, it has history", he said. The proliferation of CubeSats is a showcase for the thriving space industry.

The African Union is promoting the new space economies with the "Agenda 2063: The Africa We Want" that places space science and technology as central means to meet continental challenges such as agriculture and disaster management, and create jobs. For this, the African Union formalized the African Space Agency, guided by the African Space Strategy as a regulatory framework, to promote space activities for peaceful use.

Director Ouedraogo stressed that the African space sector holds many still untapped opportunities for business development, with estimations amounting to \$10 billion of annual value by 2024. To benefit from the promising ecosystem and develop space-based solutions for the African people, the African Union set guiding strategic actions that aim to: accelerate the accessibility of space; promote good governance and management; increase exchange and coordination among African national space actors, academia and businesses; and foster international collaboration with the European Union and UNOOSA, among others.

***Mahama Ouedraogo's remarks start at 1:10 min in the recording.***

## **Hugo Costa**

Member of the Board, Portuguese Space Agency

*Hugo Costa holds a Master's degree in Space Studies from the International Space University and an MBA from the Frankfurt School of Finance and Management. He worked at the FCT Space Office as the Portuguese representative at ESA, in the space industry both in Space and Ground Segment in Spain and Germany, and at EUMETSAT in the Copernicus Program Office. He now serves on the Executive Board of the Portuguese Space Agency.*

Despite the profound transformations in the space sector and resurfacing of "New Space" in the past decade, Costa acknowledged the difficulties in countries where the space ecosystem is not developed. During his remarks he introduced Portugal's history as an example of how even smaller countries can contribute to space: Portugal initiated space activities in the year 2000 upon joining ESA by developing its academic research and industry, and established its national space agency in 2019.

He stressed that the partnerships with African institutions and companies will be crucial, and welcomed cooperative activities. Lastly, he highlighted Portugal's efforts during the EU and ESA presidency such as the Lisbon Manifesto and the Europe-Africa Earth Observation High-Level Forum organized with the African Union Commission, ESA and other European institutions.

***Hugo Costa's remarks start at 12:26 min in the recording.***

## II. SESSION 1

### **Abimbola Alale**

Managing Director and CEO of NIGCOMSAT

*Abimbola Alale is MD and CEO of Nigerian Communications Satellite Limited (NIGCOMSAT). She holds a PhD from Nasarawa State University, Keffi-Nigeria, a Master's degree in Space Studies and an MBA from the International Space University. Alale is a Fellow of the African Scientific Institute, Certified Forensic Investigation Professional, and a current Council Member of the 2021 World Economic Forum for Global Future Council on Space.*

NIGCOMSAT is a government-owned satellite operator, supervised by the Nigerian Federal Ministry of Communication and Digital Economy, managing governmental investments in communication satellite resources. Their mission is to provide seamless connectivity and satellite communication solutions through innovation. NIGCOMSAT currently offers services to over 40 African countries and operates multiple facilities and ground stations. The products range from transponder leasing, broadband services, multicasting to retailing with e.g. pay TV.

In her remarks, Alale highlighted that NIGCOMSAT deployed the first African Satellite Based Augmentation System in providing navigation solution for Africa by Africa and over the Indian Ocean. She also spoke about how NIGCOMSAT supported the presidential task force by providing satellite band services for COVID19-related operations, reaching out rural areas to inform people about real-time developments of the pandemic. Alale also mentioned an example of how NIGCOMSAT has been contributing towards the development of Nigeria's digital economy. In fact, NIGCOMSAT spearheaded the national policy on VSAT core skills training to equip Nigeria's youth with digital skills and to promote employment. Over 600 youth were trained on VSAR/TVRO installation skills across 6 geographical zones in Nigeria in 2021, and more are planned to be trained in the coming years. Last, Alale highlighted that NIGCOMSAT developed a platform to deliver telemedicine services and support satellite solutions in the oil and gas industries.

***Abimbola Alale's remarks start at 21:21 min in the recording. Her presentation is available [here](#).***

### **James Barrington Brown**

CEO of NewSpace Systems

*James Barrington Brown is the CEO of NewSpace Systems. He is an Electronics Engineering Graduate with 30 years of experience in the commercial satellite industry. Brown is also the founder of the UK SSBV subsidiary, where the space component product-line was initially developed and manufactured prior to relocating to South Africa.*

Brown presented NewSpace Systems, an upstream supplier exporting to 27 African countries. When founding the company in 2014, the choice of the location where the company would operate from was South Africa due to its existing strong foundation of supply chains through the defense and automotive industries. Brown highlighted the advanced academic landscape and talent as important considerations for upstream activities.

The African continent holds many opportunities due to its sheer size and the number of applications for space-derived services, such as agritech and disaster management. Still, Brown highlighted that there are obstacles to keep in mind because South Africa still needs to grow as a space actor at a global level. He stressed that the level of credibility may be considered lower compared to established space actors, such as the USA or Europe, and building an international brand is challenging. Speaking from his own experience, he underlined other difficulties: first, scaling-up a start-up and growing too much, too fast, led to shortages in the supply chain; second, finding people with the right skills and retaining talents is essential; third, getting funding is pivotal. On this last point, Brown said that it is crucial to not only attract investors but also pick the right ones at the right time.

As to his outlook on the commercial space sector in Africa, Brown concluded by emphasizing that there is already a huge capability on the continent, and that Africa needs to source from its own and look less to buy from established space-faring nations.

**James Barrington Brown's remarks start at 31:05 min in the recording. His presentation is available [here](#).**

## **Bruno Henrion**

CTO of RascomStar

*Bruno Henrion is the CTO and CCO of Rascomstar. He graduated from Ecole Centrale de Lyon and Ecole Supérieure des Télécommunications in Paris. After a career in Orange Business Services, where he was heading the "Satellite Factory", he joined Rascomstar as CTO in 2014.*

In his presentation, Henrion touched upon the lessons learned about doing space business in Africa with RascomStar, an operator created by 45 African governments with the goal to give access to space-derived services to rural areas. The goal is to "connect the unconnected" and provide capacity and services such as TV broadcast, GSM backhaul, and VSat broadband.

Henrion started off by saying that RascomStar shows that it is indeed possible to build something "Made in Africa". He pointed out that the African market is not necessarily easy: on the one hand, prices for telecommunication capacity are dropping due to overcapacity, on the other one, there is high demand for both private and public uses in education, health and defense. Still, the prospects of satellite services are very promising, especially given the slow rollout of submarine cables and fiber. Selling raw space capability is difficult - "you need to move up the supply chain and sell Mbits, not MHz", said Henrion. Another lesson



learned is that it takes patience; sale cycles are slow, but the demand is there. Even though governments have got a real interest, it is worth looking into the private sector too.

Henrion's forecast for the future of the satellite industry in Africa is bright. Yet, big investors going for big constellations in low-earth orbit might change the equation for the African market. For space companies to take off, it needs understanding of the local market, and funding through PPPs, which he considers a "must" to move forward.

**Bruno Henrion's remarks start at 43:45 min in the recording. His presentation is available [here](#).**

## **Francisco Vilhena da Cunha**

CEO of GEOSAT

*Francisco Vilhena da Cunha is the CEO of GEOSAT. Previously, he held management positions at CEiiA, EEA (Empresa de Engenharia Aeronáutica), and the International Risk Governance Council in Portugal. He also acted as advisor of the Secretary of State of Science, Technology, and Higher Education in Portugal. Vilhena Da Cunha has a degree in Aerospace Engineering by Instituto Superior Técnico and a PhD in Engineering and Public Policy.*

Providing the view of the earth observation service providers, Vilhena da Cunha first explained the product portfolio that GEOSAT offers. This is relevant because the solutions depend on the purpose: for example, agriculture, environmental management and maritime traffic monitoring work with larger resolution pictures compared to e.g. homeland security. In Africa, GEOSAT has been working together with the EU and ESA on a number of projects, providing increasing coverage since 2010. Targeted initiatives develop services tailored to proper continental challenges such as the agricultural sector in Mozambique or maritime surveillance applications for vessel identifications.

Vilhena da Cunha underlined that the earth observation market is relatively new. According to him, the trend goes towards the development of concrete applications and integrated services embedded in the supply chains, moving away from large satellites and selling images only. Here, he said, one size does not fit all: the solutions that are needed in the agricultural sector are different from what maritime surveillance requires.

About the challenges in the earth observation business in Africa, Vilhena da Cunha noted that while it is easy to find users, companies need paying customers; otherwise, it is difficult for commercial services to subsist in the long-term. In the future, he sees the joint development of satellite constellations space-capabilities for new services in Africa. For this to succeed, it will take better coordination of national space-based assets or with European satellites.

**Francisco Vilhena da Cunha's remarks start at 53:05 min in the recording. His presentation is available [here](#).**

## John Lewis

Head of New Business Ventures at agriBORA

*For over 25 years, John Lewis was Managing Director of Telespazio VEGA, a space company located in Darmstadt, Germany. He has worked on projects in Africa and is currently supporting the German Space Agency (DLR) in running the network "Space2Agriculture", which links up the space sector with the agriculture domain.*

Lewis explained that the mission of agriBORA, a Kenyan company founded by Kizito Odhiambo, is to bring digital and space technology to smallholder farmers in Africa by supplementing consolidated local knowledge (i.e. national and local government, radio, field agents) with new technologies, e.g. satellite remote sensing and positioning. agriBORA was accepted to ESA's Business Incubation Center and is currently working with the European Commission's Joint Research Center on a study on the impact of COVID and desert locusts on farmers.

The system of smallholder farmers in Kenya is very fragmented and the lack of trust and communication between businesses and the farmers make it difficult to do business. Moreover, farmers often do not have an address, not to mention internet receiving systems or understanding of the opportunities new technology holds. To bridge these obstacles, agriBORA developed a digital hub connecting businesses with farmers, where the partners can view a dashboard providing them with the data and information they need for decision-making, whereas the farmers can register via a small GPS device.

During his remarks, Lewis shared his thoughts on the commercial space in Africa. In his opinion, the commercial satellite sector will be driven by downstream markets in agriculture, energy, mobility and health. Yet, European and American technology alone will not suffice, he said, it takes a realistic view about the environment and available infrastructure, and people on the ground who understand how to do business in Africa. His piece of advice for entrepreneurs therefore is to do the research beforehand and build networks in the sector.

**John Lewis' remarks start at 1:05:17 min in the recording. His presentation is available [here](#).**

## QUESTIONS AND ANSWERS

### How do you see the future of the African commercial space sector?

**John Lewis:** What we see today is that the downstream market is driving the upstream market. The development and launches of CubeSats are a response to this. In Europe, many companies, start-ups and SMEs are already developing specific applications, which use space technology for the agricultural domain (e.g. plant recognition, soil analysis and yield estimation). In Africa, the future will be or should be driven by the downstream market placing demands for the space technology, which is currently not available at the right price.

### How do we ensure that the commercial space sector in Africa can thrive?

**James Barrington Brown:** Governments need to have confidence in their own population and industries. Currently, they tend to choose universities to start developing the technology or applications and encourage them to spin-off companies. However, if the point is going commercial, they should fund start-up companies directly. These companies have a commercial and entrepreneurial drive and financial reasons to make their businesses successful, whereas universities are fully funded and focus more on research. The government can provide the funds and can be the primary customer to companies, but it should put its demand to the industry.

**Francisco Vilhena da Cunha:** Endeavours in space are a risky business, but there are two examples that show that it can be done. First of all, the lessons learned from the example of Portugal's space industry are important. What was a substantial accelerator in the two decade-long build-up was the creation of a space agency. Strategy needs to happen in the private sector and companies need to develop their own, not replicate the governmental one. While this can mean that the strategies are not fully aligned in the short-term or medium-term, companies benefit from the space strategy. Governments do not have a lot of experience with space, compared to other traditional sectors, so having a space agency raises the bar for commercial space activities. Secondly, starting downstream is the way to go. However, sometimes the users do not know what they need or how to use the opportunities that earth observation provides. Collaborative laboratories in Portugal were successful in bringing together scientists and engineers to foster mutual understanding each other's work and thus increase market awareness.

**Abimbola Alale:** Africa needs to be more proactive. There is already an ongoing effort to create an African Space Agency. Once established, a common space policy needs to be developed. It will provide the necessary policy framework that would enable PPP collaboration, cooperation and partnerships, encouraging and accompanying start-ups and companies in their endeavours. Here, more focus needs to be put on the upstream industry. For the commercial space sector to thrive, it needs to be perceived and treated less like "social services" (i.e. charging inferior prices), but as a real business. Additionally, capabilities and expertise from all African countries should be better sourced and pooled. Using synergies with partners can further enhance growth prospects. The space sector is not well understood by policymakers or by the African population - it is still too far away.

Other stakeholders, in particular non-space actors, need to join conversations like these to understand what is being done in the space industry.

### **Are there any countries that implemented policies regarding research and education in space?**

**Abimbola Alale:** The Nigerian National Space Policy, a program with a 25-year roadmap, was recently reviewed. In this process, the National Space Research and Development Agency adapted the course and announced they want to venture into different areas and aspects e.g. robotics and remote sensing.

### **How can African countries attract investment in space infrastructure?**

**Bruno Henrion:** There is a lot of untapped need in the very lucrative telecom sector. The question is whether governments want to fund it for social purposes or whether business wants to make profits. Certain programs can be financed by governments. Africa should react before the big corporations come and take the whole market. The actual problem is coordination: if there is good coordination, things can move to the concrete mode and think long-term to go faster.

### **How are you able to convey to farmers in Kenya that space technology spin-offs can be beneficial to them?**

**John Lewis:** There are two parts to it. The first question is how do you get to the individual farmers? They are ultimately the ones involved in the actual work, i.e. planting and harvesting. The second question is whether they are interested about where the advice comes from as long as it is good advice. AgriBORA first created a concept of farm hubs - large groupings for farmers on a subcounty level. They become focal points for trainings, explaining to the farmers the benefits that agriBORA disseminates. We look for people to run the hubs who have the education to understand the benefit space technology can bring, as well as entrepreneurial spirit. It does not suffice telling the farmers that satellites can support them in their work; you need to present how can concrete applications like soil analysis help them with e.g. the seeds.

### **What advice would you give young or new entrepreneurs that want to start a space business?**

**James Barrington Brown:** Start a downstream one business rather than an upstream!

**Francisco Vilhena da Cunha:** First, connect to the market. Engineers think of technical solutions, but sometimes the market is not there for it. Second, if you have the training to work in space, you can also work in other sectors that pay better and are less risky. People want to work in space because it is challenging, they connect with it and they know they can have an impact, so be resilient.

**John Lewis:** If you are not obsessed by the idea, do not do it. And if you do, do not expect to be paid in the first two years. And on a less negative side, the most exciting thing you can do in a young career is to be an entrepreneur - but this is why you really need to be obsessed by this idea.



### III. SESSION 2

#### **Temidayo Oniosun**

Managing Director of Space in Africa

*Temidayo Oniosun is the Founder and Managing Director of Space in Africa. With over seven years of experience in the industry, Temidayo advises governments and space companies and recently led the studies for the establishment of the African Space Agency for the African Union Commission. Temidayo is a 2020 Karman Fellow, a Forbes Africa 2021 "30 Under 30", and regularly appears on media commenting on African space and satellite programs. He holds an MSc from the University of Strathclyde, Glasgow.*

In his presentation, Oniosun touched upon the work of Space in Africa, a media analytics and consulting company that conducts data-driven market and businesses analyses in the African space and satellite industry, therefore contributing to effective policymaking and lifting barriers to new investments across different markets.

Oniosun gave the audience some insights in the African space ecosystem and the NewSpace Industry that is projected to be valued at \$10.2bn by 2024. Most revenue is derived from satellite television, accounting to roughly 80% of the total revenue. He highlighted the unequal distribution of companies and space activities: while 44 satellites were launched last year and 114 additional ones are under development, more than 60% of them were deployed on behalf of Egypt, South Africa, Nigeria and Algeria. These countries also host most of the downstream companies, whereas the upstream industry is limited to South Africa only.

Despite the inflow of investment in the tech ecosystem, he said, this has not yet materialized in the space sector where most companies still depend on bootstrapping for their operations. The problem lays in the lack of understanding of the space sector among African investors. He named the Airbus Africa for Future program as one example that proves that investing in African space companies and start-ups is reasonable.

***Temidayo Oniosun's remarks start at 4:38 min in the recording. His presentation is available [here](#).***

#### **Amr Emam**

Head of Space Segment at Nilesat

*Amr Emam is the Head of Space Segment at Nilesat, an Egyptian operator of satellites and provider of various kinds of services such as television and radio throughout the Middle East and Africa.*

During his remarks, Emam offered an insight in the work of satellite operators: NileSat operates a fleet of Egyptian satellites and associated ground station, covering the whole MENA region and providing broadcasting services to more than 60 million viewing points.

Media, Emam highlighted, serves as source for information, entertainment and education alike. With the pandemic came a change in behavior that affected the business and

operating model of media and advertisement companies: the average time spent in front of television increased, the demand for information on current events was high and new television formats surged.

According to him, the African market is vast in terms of users, comprising 16% of the world's population, with a strong growth of the TV market despite barriers such as the availability of electricity and purchasing power. Free-to-air TV is dominant in Africa, where 75% of the continent's households are accessing these services. The key drivers are the economic growth and emergence of a middle-class eager to pay for TV services, new projects and services, and local content.

**Amr Emam's remarks start at 12:05 min in the recording. His presentation is available [here](#).**

## **Kammy Brun**

Managing Director at HEAD Aerospace

*Prior to joining HEAD Aerospace, Kammy Brun worked at Airbus Defense & Space within the strategic business growth division, at Astrium Services in Paris, and at Euroconsult, a private consulting firm in Paris specialized in the space sector. Brun holds a degree in Applied Physics Engineering and graduate degrees in International Business Affairs and in Legal Commercial Translation.*

Brun started by providing a short introduction of the portfolio of HEAD Aerospace: earth observation, operation of its own IoT satellite constellation "Skywalker" and the space component engineering business unit.

The private space company has been working on a project in Ethiopia since 2019 involving a remote sensing ground receiving station and the provision of optic/radar images, proposing the entire value-chain from the systems to the software. Using this example, Brun highlighted the challenges of doing business in Africa, namely cultural and language barriers, and lack of end-user awareness and understanding of how space technology can bring value. In Ethiopia, the focus was on yield prediction and precision-farming to maximize productivity in the agricultural sector. Here, it was not only about the technology and the infrastructure, but also the know-how on how to operate and use it.

For its IoT satellite constellation, HEAD Aerospace envisages different use cases in areas where internet or cell phone coverage is poor, such as tracking water temperature and Ph-levels for fish-farming in Kenya or tracking illegal animal trade in South Africa.

Brun stressed that there is a lot of untapped potential in the African space sector, but the end-users are far away. Investments need to be further promoted. Among key success factors that she identified are close collaboration with local governments and stakeholders, as well as having a team on the ground close to the end-users. Her lesson learned is that launching pilot projects helps with increasing end-user awareness and benefits perception.

**Kammy Brun's remarks start at 31:10 min in the recording. Her presentation is available [here](#).**

## **Vivyann Meta**

Director of Business and Technical Services at LocateIT Limited

*Vivyann Meta is Director of Business and Technical Services at LocatedIT Ltd. A Geomatic Engineering graduate, she has experience in the use and application of Geographic Information Systems, Earth Observation, Surveying and GIT technologies. She also serves as the national representative for Kenya for the African Aeronautics and Space Organisation and is a member of the African Leadership Conference on Space Science. In 2019, Meta was listed among the Top 10 under 30 Space professionals in Africa.*

LocateIT Limited is an African GEO-ICT company based in Nairobi, Kenya, and offering space and geomatics products, services and solutions, with a focus on projects linked to food security. Meta explained that they resell high-resolution imagery from partners such as Airbus and offer environmental modelling services. The core belief is that reliable data and information are required for evidence-based decision making to be transformed into sustainable initiatives that yield transformative impact.

Meta proceeded by introducing concrete projects that the company is working on. For example, KILIMO, a Kenyan innovation for low input maize production, uses earth observation and crop modeling to sustainably support agricultural value chain digitalization. By providing knowledge on soil and crops, agricultural authorities can be supported in the design and implementation of policies for efficient and sustainable farming.

As part of her lessons learned, Meta shared her insights about building a space business in Africa: it takes innovative and smart solutions, and the focus needs to lay on user needs and human-centered designs. Apart from encouraging investment in R&D, PPPs across regions are crucial to enable the space economy. Leveraging the private sector will allow to leave no one behind and fast-track last-mile connectivity.

***Vivyann Meta's remarks start at 45:05 min in the recording. Her presentation is available [here](#).***

## **Pauline Bourg**

Business Development Africa at Airbus

*Pauline Bourg is working in the Business Development Section of Airbus Defense & Space focusing on the African continent. She is also a member of the Airbus Africa Community, an Employee Resource Group engaged to change the way Africa is perceived. Bourg holds a graduate degree from the INSEEC Business School.*

A well-established global company, Airbus has built a reputation for the delivery of space-based systems and services in all segments of the value chain for a variety of fields and customers. The African continent represents a young and dynamic market, Bourg underlined, and Airbus' primary partners are public space agencies (e.g. South Africa, Egypt and Nigeria). In a joint project with Algeria, Airbus launched the ALSAT satellite constellation for disaster and agricultural monitoring.

The development of advanced digital space-based applications for relevant sectors such as the agriculture, mining and oil and gas industries represent new opportunities that do not require sending people into the field. To harness the technology and foster sustainable growth in the African commercial sector, it will take increased capacity-building and Pan-African space programs with backing by companies such as Airbus, transferring their technology and knowledge to the partners. This goes in hand with the promotion of partnerships, which Airbus is doing with the remote start-up acceleration program "Africa4Future" together with the GIZ and implemented by the Co-Creation Hub, which has already helped 30 startups.

Bourg underlined that the future of space in Africa is bright. Space capabilities are essential and are enablers for connectivity, climate monitoring and security. Demand and need for space applications will grow in the longer term.

**Pauline Bourg's remarks start at 59:00 min in the recording. Her presentation is available [here](#).**

## **Olugbenga Leke Oyewole**

CEO of Atlantic Factorial

*Olugbenga Leke Oyewole is the CEO of Atlantic Factorial Limited and Chairman of the Amethyst Health Care & Diagnostics Center. Oyewole holds degrees in Chemistry and Environmental Management from the University of Lagos in Nigeria, and a Doctor of Philosophy from Global Oved Dei Seminary and University in Florida, USA. He previously served as Special Assistant on Maritime Services to President Goodluck Jonathan in 2011 and held technical and managerial positions across various industries.*

Established in 2010 in Nigeria, Atlantic Factorial envisions to be the biggest repository of empirical space-derived data to governments, institutions, corporate bodies and individuals for maritime, aerial and terrestrial activities, changes and effects.

Oyewole gave a detailed insight into the maritime sector, for which his company provides data to governments and relative agencies on e.g. illegal fishing and human trafficking. Space-derived data is fundamental for evidence-supported decision-making. As a success story, Oyewole highlighted a project involving the provision of high-resolution maps of Victoria Island and Lekki areas of Lagos for improved city management.

His observation was that the awareness for space application of technology is limited on the continent. This is especially true for telemedicine that can reach remote rural areas and provide access to medicine, even from abroad. Some challenges highlighted include the lack of financing and convincing governmental officials to adopt satellite technologies. To raise awareness about the opportunities of space, Atlantic Factorial holds live lectures to educational institutions across Africa.

**Olugbenga Leke Oyewole's remarks start at 1:10:06 min in the recording. His presentation is available [here](#).**



## **Jessie Ndaba**

Co-founder and Managing Director of Astrofica

*Jessie Ndaba graduated as an Electrical Engineer at the University of Witwatersrand. She previously worked at CBI, as a lecturer at Central Johannesburg College, at SunSpace and at Space Commercial Services, before co-founding Astrofica Technologies in 2017. In 2013, together with other young African space professionals, she formed the African Space Leadership Congress Youth Forum. Ndaba is also a member of the Space Generation Advisory Council.*

Speaking from an upstream perspective, Ndaba shared her insights at Astrofica, a satellite constellation operator for space-based solutions for water and agricultural management and monitoring. Core capabilities are assembly, integration, testing and ground support equipment. “Everything is connected together, in each and every step, from assembly to launch”, said Ndaba.

Heritage is very important in space, which involves learning from past projects. However, Ndaba added that the exposure to the downstream sector and end-user was eye-opening; engineers design the systems, sensors or satellites and, once developed, look for customers. It is important to get to know the users first, which is why Astrofica conducted a market analysis in South Africa and found out that they were not addressing the needs of their customers. Solutions catering for African needs are the ones generating actual impact, such as the monitoring of harmful algal blooms in South Africa that disrupt maritime environments and cause lobster and economic loss.

For Ndaba, the biggest takeaways in promoting satellite technologies in Africa were to use a language that is understandable to the end users. This means less technical details about the satellites and more concrete use cases. For a sustainable future, in her opinion, Africans need to stop being consumers of technology, but become drivers by working together.

**Jessie Ndaba’s remarks start at 1:26:30 min in the recording. Her presentation is available [here](#).**

## QUESTIONS AND ANSWERS

### **What are the success criteria in the African space sector and how to measure them?**

**Kammy Brun:** It is not easy to measure success. As a foreign company, getting in there is the hardest part and this happens before you write a strategy and define indicators. What we called a success was the seamless integration of the ground station in Ethiopia. The next steps are the operation and the deployment. Qualitative and quantitative KPIs to measure the development of space technology in the field can include the identification of applications and also how many projects are deployed to how many customers.

**Temidayo Oniosun:** There are several ways to measure success. You could for example look at the socio-economic benefits of the projects - what are they changing and how are they impacting the continent and addressing different problems?; the purely economic returns - how many jobs are created? What are the investment returns?; but also capacity investments - how are countries improving technical capabilities?

### **How can African countries attract investments in space infrastructure?**

**Olugbenga Leke Oyewole:** The question is how to integrate foreign investors. It is up to state policies to create a "soft landing" for foreign companies. You need to create a tight synergy between the investor, the governments and the agencies that are directly managing the project. Governments must take charge of this directive. Foreign companies need to work with the national space agencies and not just buy land and build a ground station.

**Amr Emam:** There are many opportunities for space business - removing the obstacles will be a great challenge. Working together will be inevitable to face global competitors like mega constellations companies. When rebuilding in the post-pandemic world, we need to take advantage of all different sectors, which also means promoting telemedicine and education, and rethinking the role of satellites.

**Jessie Ndaba:** If you start a company, that means you are already an entrepreneur and interested in making profits. Most investors look also to the social aspect, but are of course very much interested in return on investment. And there are so many opportunities in Africa, it is a blank canvas, there is so much that can be done. If we want to attract investors, we need to speak their language. By the same token, we need to identify the challenges that could be serviced using space technology.

### **What advice would you give young entrepreneurs?**

**Jessie Ndaba:** My advice for the people working in the upstream industries would be get in touch with the downstream companies. This will not happen overnight, it will take a while, so be patient. My lesson learned is that having a side hustle can help: at Astrofica we also do consulting work for clients.

**Vivyann Meta:** Companies or technocrats think that they provide services to end users. Sometimes, you might find out that what they need are not complicated approaches to

solving their problems. Evaluate the market you want to get into and think about which services and solutions you want to provide. Once you get in, you get in to stay.

**Olugbenga Leke Oyewole:** If you are a newcomer in the space sector, introduce yourself to the government. African governments always want to know about the concrete benefits. If you are able to convince them of the value of your services or that it will bring money, they will listen to you.

## CONCLUSIONS

The one-day conference “Space Economy: Africa in Focus” gathered representatives of space businesses from different countries, regions and industries. Not only were success stories and cases from upstream and downstream providers and operators shared, but speakers also touched upon obstacles and lessons learned from doing space business in Africa.

Despite the various sectors and countries represented, a number of common observations were reiterated throughout the event. The speakers agreed on three core elements about the role and outlook of space economies in the African continent:

### **I. The future of space is bright in Africa.**

The continent holds a lot of untapped potential and an increasing demand for space-enabled services. Satellites are already helping to reach remote and rural areas and connect the previously “unconnected” of the most populous continent, a broad (potential) user base. As underlined by many of our speakers who themselves work in this field, agritech is a prominent application of space-derived information that will be central in mitigating the consequences of climate change. Furthermore, they predict that the African space sector will be driven by the downstream markets in energy, education, mobility and health. Developing solutions for these centenary challenges will fundamentally impact the lives of many African people and promote sustainable socio-economic growth - in particular for the post-pandemic recovery.

The promises of the African space sector are not only reflected by the rising number of space companies and satellite launches: African governments show increased interest and investments in space programs. The growing backing from the respective governments gives reassurance to companies that are steadily scaling up operations to generate revenue. The consolidation of efforts into concrete policies will further provide a legal and regulatory framework for private sector actors interested in getting into the African market. This African Space Policy and Strategy together with the establishment of the African Space Agency will facilitate coordination and cooperation among African states and companies.

### **II. Working in the African space sector poses some challenges to consider.**

While the opportunities are manifold, some inherent obstacles to doing space business in Africa have to be taken into account.

The central issue is that there is not much understanding of the space sector and applications of space technology, not to mention the benefits they bring. For many businesses, it is hard to convince potential users, but also governments of the advantages of leveraging space-based technology and therefore hard to get the support they need to develop their products. This leads to another fundamental shortcoming - funding. Unlocking investments will be crucial to enable space companies and space economies to thrive in Africa. Apart from increased encouragement of investments in e.g. R&D, public-private partnerships can be a solution to overcoming the current *modus operandi* of bootstrapping flow of investments. The African space sector concentrates on downstream



companies because of the lack of infrastructure in most countries that is necessary for upstream activities to unfold.

A recurring call from the speakers was for enhanced cooperation among African countries, to source from the African continent and look less to buy from other space-faring nations. To harness more opportunities, promoting local entrepreneurship and initiatives that are “Made in Africa for Africa” can contribute to the development and sustainable growth of vibrant national space economies that in turn will help achieve the SDGs.

### **III. The main lessons learned: get to know the local environment and end-user.**

The examples of successful projects presented by the speakers show that it is possible to develop a prosperous space business in Africa, with an impact that the entire continent can benefit from. Three key takeaways stood out as they were echoed by several of the speakers:

1. **Local knowledge** is fundamental. Advanced technology alone does not suffice if the products are not adapted to the environment. To overcome this, doing research and evaluating the market is crucial.
2. To have an impact, services need to be developed with an **end-user-centric approach**, i.e. knowing the customers and meeting their needs, deliver human-centered designs that are easy to understand and tailored to concrete scenarios.
3. Whether upstream or downstream businesses, operators or providers, governments or (potential) users, **getting in touch with stakeholders** and **building networks** in the sector is central to advance the business and ensure last-mile connectivity.

## **NEXT STEPS FOR THE SPACE ECONOMY INITIATIVE**

There is no doubt that there is more space to come - in Africa and worldwide. Promoting vibrant national space economies will help achieve the SDGs, to which the space sector can contribute in a variety of ways, ranging from monitoring to telecommunication to education on an individual, local, regional, national and multi-national level. What these fruitful discussions showed is that there is a need to engage in more conversations about the regional dimension of space economies and their specific requirements, realities and dynamics.

To encourage those, moving forward, UNOOSA's Space Economy Initiative will continue to shed a light on the trends and perspectives of different space economies and bring together stakeholders from different sectors and countries.

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For an initiative funded entirely by voluntary contributions, donor support is crucial to realizing this vision. Stakeholders interested in contributing to building responsible and dynamic space economies for sustainable socio-economic development are encouraged to get in touch with Veronica Cesco, Associate Programme Expert, at [veronica.cesco@un.org](mailto:veronica.cesco@un.org).

More information about the event series is available on the [UNOOSA Space Economy webpage](#).