The space race in the Red sea region

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The Red Sea is one of the world's most important trade routes, with its southern tip in Bab al-Mandeb strait (between Yemen and Djibouti) and its northern edge in the Suez Canal and the Gulf of Aqaba. More than 10 percent of global shipping traffic passes through it every month, including 4 percent of the world's daily crude oil supply.

The Red Sea and the Gulf of Aden region are composed of nine countries along the coastlines: Somalia, Djibouti, Eritrea, Sudan, Egypt, Israel, Jordan, Saudi Arabia, and Yemen. But, in its wider geopolitical context, the term also includes Ethiopia. This country of 100 million people, although is landlocked country and does not have any Red Sea coastline, is one of the region's most important players and needs to be included in the region in order to provide meaningful analysis.

The region's unique mixture of historical colonial-power competition, political rivalries, state fragility and emerging circumstances make the Red Sea region one of the world's most unstable theaters.

The region is characterized by conflicts between the regional powers. Outer space has become one more domain in the regional conflicts and the shifting balance of power in the region. The space competition is part of the completion for regional dominance and considered as a fundamental component of national security.

This article analyzing the latest developments of the space programs of three of the countries in the Red sea region: Egypt, Sudan and Ethiopia.

Egypt and the space race

Egypt has successfully launched its Tiba 1 Satellite from a space center in French Guiana in South America on November 26, 2019. It occupied the upper passenger

position in Ariane 5's dual-payload configuration on the mission, which is designated Flight VA250 in Arianespace's numbering system. [1]

Launched by an Ariane 5 rocket, Egypt's first telecommunication satellite was initially scheduled to launch on November 23, 2019, but the launch was postponed due to a malfunction in the power supply to the launching platform. [2] It was due to be launched on November 25, 2019, but then was postponed for a further 24 hours. The decision to put off the launch was not due to technical problems, but was rather due to the weather conditions and wind in atmospheric levels at an altitude of 30 kilometers above ground.[3]

The TIBA- 1 satellite

The communications spacecraft was developed by Airbus and France's Thales Alenia Space (TAS). Weighing approximately 5,600 kg, it has an electric power capability of higher than 9 kW. TIBA-1 was designed for a service life exceeding 15 years, according to data by Arianespace. Airbus supplied the Eurostar E3000 platform and assembled and tested the spacecraft, while leading partner TAS designed and built the communications payload, featuring a dual mission in Ka-band for secure and broadband communications.

The decision to launch came after intensive meetings between the French company Ariane Space and a high-level Egyptian delegation at the launching base in the city of Kourou in French Guiana. TIBA-1 was flown to French Guiana in October 2019 ahead of its scheduled liftoff from Kourou on an Ariane 5.[4]

The Egyptian telecommunications satellite, TIBA- 1, is a major milestone that will see internet and telecom services cover the entire country. Designed to remain in service in orbit for more than 15 years, TIBA-1 will be Egypt's first push into satellite-based internet services. It will be key to enhancing the country's land telecom and internet networks, giving millions of people in remote and rural areas internet beamed down from space.

The satellite will help bridge the digital gap between urban and rural areas, and will contribute to the development of all government sectors, the Egyptian cabinet said. The satellite will also offer internet and telecom services to some Nile Basin and North African countries, and is the first in a series of TIBA Sat satellites that Egypt is planning to launch.[5] It is also expected to serve the sectors of energy, education and health, as well as to help all state bodies' combat crime and terrorism.

The move came in implementation of President Abdel Fattah El Sisi's directives to develop the Information and Communications Technology sector, in line with the Sustainable Development Strategy, Egypt's Vision 2030. [6]

Egypt's space program

The Egyptian satellite program has both scientific and military implications. Egypt's first space program was initiated in 1960 and was subsequently shelved numerous times until its first independent budget was adopted in 2000 to fund space research. Egypt became the first Arab country to put a telecommunications satellite into space with the launch of NileSat 101 in 1998. It was followed in 2000 by Nilesat 102, which helped distribute hundreds of satellite TV channels.[7]

The Egyptian satellite program is run under the National Authority for Remote Sensing & Space Sciences (NARSS). In January 2018, Egypt's president Abdel Fattah El-Sisi ratified a law establishing the country's first Egyptian space agency, aiming to develop and transfer space science and technology into Egypt.

EgyptSat-1 - in 2007, the Egyptian government made its first attempt to acquire its own high-resolution surveillance satellite with the launch of the Egyptsat-1 spacecraft built in Ukraine. The first satellite EgyptSat-1 was launched from Baikonur on April 17, 2007. However, the contact with it was lost.[8]

In 2009, after years of negotiations, Egypt awarded a contract to Russia for the development of a high-resolution imaging satellite.

EgyptSat-2 - a Soyuz-U rocket carrying an Egyptian observation satellite, EgyptSat-2, was launched from the Baikonur Cosmodrome in Kazakhstan on, April 16, 2014. The nearly 43 million US dollars, EgyptSat 2, is owned by Egypt's National Authority for Remote Sensing and Space Sciences. The satellite was expected to have an operational lifetime of 11 years. The Russian-built Egyptsat-2 satellite was designed to provide high-resolution imagery for the Egyptian military and other government agencies in the country. The development and launch campaign for Egyptsat-2 has been conducted largely in secret. In April 2015, the EgyptSat-2 completely failed in orbit but there was no official confirmation or denial from the official sources.

EgyptSat-A has been built as a replacement for EgyptSat-2. The Egyptian satellite Egyptsat-A was lifted off by a Soyuz-2-1b/Fregat rocket, on February 21, 2019, from the Baikonur Cosmodrome in Kazakhstan. EgyptSat-A is a high-resolution Earth observation satellite developed by the Russian corporation RKK Energia on behalf of Egypt's National Authority for Remote Sensing and Space Sciences (NARSS).[9]

The satellite EgySat-A aims to support Egypt's "presence in space", to establish the presence of Egyptian scientists and researchers in outer space and to increase new investment opportunities and enhance developmental projects.

Sudan's first satellite

Sudan's first satellite, the Sudan Remote Sensing Satellite (SRSS)-1, was successfully launched on November 3 ,2019 by a Chinese Long March 4B satellite launch vehicle from the Taiyuan Satellite Launch Centre in China's northern Shanxi Province. The Long March 4B launch included the Gaofen-7, Xiaoxiang-1 08, and Whampoa-1 satellites, all owned and operated by Chinese entities.[10]

In early 2019 the Government of Sudan rolled out ambitious aerospace, aviation and telecommunication project development portfolio; which included a plan to launch the Communication Satellite (SUDASAT-1) and the Sudanese Remote Sensing Satellite (SRSS-1) into space.[11]

Lt. Gen. Abdul Fattah Al Burhan, Chairman of the Sovereignty Council, Chairman of the Security and Defense Council, during his first meeting with the members of Security and Defense Council on November 12, 2019, announced the launch of the first satellite for military and economic purposes in partnership with a major country.[12]

For his part, member of the Council of sovereignty, spokesman of the Council Mohammed al-Faki – said in a press statement, that the Council received a report from the President of the Council of sovereignty, on the launch of the first Sudanese satellite which will be used in military and economic purposes.[13]

The SRSS-1 was developed and built by Chinese satellite manufacturer Shenzhen Aerospace Oriental Red Sea Satellite Co. on behalf of the Sudanese government. The SRSS-1 build and launch was financed by the China ExIm Bank, though no cost amount has been reported.

The SRSS-1 will be used for both civil and national security Earth observation missions. According to a Sudanese government document, SRSS-1 will, "generate a comprehensive, cost effective and reliable data base on the topographic mapping, natural resources for developmental planning, exploration of natural resources, environmental monitoring, agricultural monitoring and yield estimation and beside public security (intelligence) and defense applications."[14].

SRSS-1 is also a springboard for the establishment and development of an indigenous Sudanese space and satellite industry that will be located in Khartoum North.

The SudaSat – a subsidiary of the SudaTel Telecom Group – leases four Ka-band transponders on the Arabsat-6A communications satellite for the provision of broadband services across Sudan. Launched in April 2019 by SpaceX, Arabsat-6A was built by U.S. satellite manufacturer Lockheed Martin.[15]

Ethiopia and the space race

The China Academy of Space Technology (CAST) is building Ethiopia's ETRSS-1 remote sensing, 70kg satellite, which is due to be launched from China on December 17, 2019.[16]

Ethiopia's Innovation and Technology Minister Getahun Mekuria on November 23, 2019, told reporters the satellite will be used for agricultural, mining, environmental protection and earth observatory purposes. The minister said Ethiopian engineers took part in the satellite's construction. A command and control center has been set up at the Entoto space observatory facility located on the outskirt of Addis Ababa.[17]

Ethiopia also leases transponders on the SES NSS-12 communications satellite, creating the EthioSat platform, and is building a satellite manufacturing, assembly, integration, and testing (MAIT) facility in Addis Ababa on a 30 month schedule starting in early 2020.[18] The Ethiopian government has an agreement with the French company ArianeGroup and funding from the European Union's European Investment Bank (EIB) to build the MAIT facility.

The history of interest in space science and technology in Ethiopia dates back to 2004 when three aspiring astronomers gathered a group of 47 space enthusiasts to form the Ethiopian Space Science Society. The Society, which has recruited over 10,000 members since being launched in 2004, achieved the milestone of establishing East Africa's only space observatory facility on the 3,200-metre hills of Entoto.[19]

In October 2016, the Ethiopian Council of Ministers approved the Establishment of Ethiopian Space Science and Technology Institute (ESSTI).

ESSTI has apparently designated its Space Engineering Research and Development Directorate (SERDD) as the lead for overseeing and administering the MAIT facility construction and handover, and will then manage the facility that is expected to be the centerpiece for Ethiopian satellite technology development and manufacturing.[20]

Following the establishment of the Space Institute, the Ethiopian Council of Ministers announced the nation's ambition to launch an earth observatory satellite into orbit in 3-5 years to improve its weather-monitoring capabilities.[21]

Summary

The launch of SRSS-1 and Tiba 1, are the latest developments in space activities in the Red sea region and along the River Nile. There are several players in the region with rising aspirations of reaching advanced space technologies and the military applications, giving way to a new competition in the region.

Sudan joined Egypt and Ethiopia in establishing national space programs as well as developing and building Earth observation and communication satellites both indigenously and by countries such as China, France, and Russia.

Countries around the world want to be members of the "space club", but few have the real ability to join it, and only about 10 countries (among them Israel and Iran) are capable of building their own satellites, launching them from their territories, and maneuvering them in space.

The Red sea region is characterized by conflicts around sovereignty and border and territorial issues. The space competition is part of the completion for regional dominance and considered as a fundamental component of national security.

The necessity of having a space program in order to remain competent has motivated many countries, to establish space programs. The majority of such programs, however, is only funded by these countries and heavily rely on foreign expertise. [22]

A growing number of countries throughout the region are acquiring high-resolution Earth observation satellites. This trend is a significant change in the region where only 10 years ago the only country that had such advanced technology was Israel, along with external powers such as the United States, France, China and Russia.[23]

Notes:

[1] Tiba 1 satellite to be launched tonight at 11:08pm CLT: Egypt's Space Agency, Ahram online, November 25, 2019.

[2] Egypt's Tiba 1 satellite launch put off, again: Space agency, Ahram online, November 25, 2019.

[3] Egypt's Tiba 1 satellite launch put off, again: Space agency, Ahram online, November 25, 2019.

[4] Egypt's first-ever communications satellite to mark major milestone in telecom industry, officials say, Ahram online, November 21, 2019.

[5] Ibid.

[6] Egypt preps to launch first ever Tiba-1 communications satellite, Ahram online, November 2, 2019.

[7] Egypt launches first telecoms satellite Tiba 1,Ahram online, November 27, 2019.

[8] Ibid.

[9] Ibid.

[10] Sudan's first Satellite SRSS-1 Launched by China, Spacewatch Africa, November 11, 2019.

[11] Sudan launches its first satellite, Sudan daily, November 3, 2019.

[12] Al Burhan announces the launch of Sudan's first satellite, Sudan daily, November 12, 2019.

[13] Ibid.

[14] Sudan's first satellite SRSS-1 Launched by China, Spacewatch Africa, November 11, 2019.

[15] Ibid.

[16] Al Burhan announces the launch of Sudan's first satellite, Sudan daily, November 12, 2019.

[17] Ethiopia to Launch satellite on December 17, ethiopianembassy.be, November 22, 2019.

[18] Al Burhan announces the launch of Sudan's first satellite, Sudan daily, November 12, 2019.

[19] Ethiopia's First Satellite Will Now Be Launched In December, 2019.

[20] Ethiopia to begin work on satellite MAIT facility with European funding, Space watch, October 14, 2019.

[21] Ethiopia's First Satellite Will Now Be Launched In December, 2019.

[22] Space exploration programs in Muslim countries: past, present and future, Muslim Science, October 1, 2014.

[23] High-resolution Earth observation data is changing the character of war, rom.eu.com, Issue #2(8) 2016 https://room.eu.com/article/high-resolution-earth-observation-data-is-changing-the-character-of-war