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Author: Mr. Yilkal Eshete
Ethiopian Space Science and Technology Institute (ESSTI), Ethiopia, yilkalc@essti.gov.et

THE FIRST ETHIOPIAN MICRO-SATELLITE (ETRSS-1): LESSONS LEARNED AND SATELLITE TECHNOLOGY KNOW-HOW

Abstract

Ethiopia has launched its first ever earth observation micro-satellite, ETRSS-1, in December 2019 in collaboration with the Government of China. The 65 kg weighting satellite was launched at a launch site in China on-board Long March 4-B as a secondary payload and was delivered in a sun Synchronous orbit of 628 km altitude. The construction of the satellite was done by China Academy of Space Technology (CAST), a government company specializing in the development of different satellite systems. The provision of the satellite was for addressing the common challenges of humankind such as climate change and its adverse effects and to bring solutions by the use of earth observation data.

The satellite has been launched to provide first hand earth observation data mainly in the territories of Ethiopia, Middle East, Africa, and other regions of interest over the globe. The satellite carries one multi-spectral camera as its payload operating in the spectrum bands of Blue, Green, Red and Near Infrared. The data collected from the satellite will be used for agricultural monitoring, water resource management, forest cover mapping, disaster and drought monitoring, and other applications related to change detection and analysis.

In the development of this micro-satellite Ethiopian engineers and scientists have participated at different stages of its development and have taken different training such as preliminary design training, critical design, ground operations, image analysis and interpretations. This joint development and collaboration has contributed a lot for satellite technology know-how and capacity building for data applications.

The collaborations seen in the development of the satellite has shown the scenario by which developing nations could take part in space technology and its applications to tackle the challenges of climate change, environmental degradation, human insecurity, poverty, and other challenges towards achieving sustainable millennial development goals.

Further to its applications; the launch of the satellite has been a big motivation for the young and the community in general in the country and has paved the way for the development of other high capacity satellite projects. Now the government has authorized the development of another two satellites in the coming years; one high resolution earth observation satellite and one telecom and broadcasting satellite.

Key words: Micro-satellite, ETRSS-1, earth observation, space technology, developing nations