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SPACE EDUCATION AND ACCESSIBILITY WITH SMALL SATELLITES- PAKISTAN PERSPECTIVE

Abstract

The developing countries have a lower capacity to design and use space technology than those of more developed countries. There are not much signs of indigenous design and use of space technology in general and satellite technologies in particular in the developing countries because of the lack of awareness of the beneficial use of satellites and also the expertise. The research suggests that the countries with developed capabilities in the use of integrated space technology can take certain timely measures to avoid damage due to some of the effects of the climate change than those with no space expertise.

Pakistan is well aware of the beneficial use of space program and has initiated a lot of steps in order to enhance the capacity building in the space related research and development activities. In this regard, the Institute of Space Technology (IST) located in Islamabad Pakistan has been striving for the betterment in accessing space, educating people in the space related fields and also in the design of space systems.

A lot of effort has been done in the use of satellites for environment monitoring including sea-level rise, deforestation trends, earthquake aftereffects and changes in glaciers which are difficult to observe from the ground.

The institute has a long tradition of space endeavors and we have participated in several national and international satellite missions.

We have actively participated in the development of Asia Pacific Space Cooperation Organization (APSCO) Student Small Satellite (SSS) project. As part of the project, one microsatellite (SSS-1) and a CubeSat (SSS-2A) has been launched during Q4 of 2021 whereas SSS-2B is scheduled to launch soon.. The SSS-1 is a 30kg micro-satellite and SSS-2A/2B are both 3U CubeSats. The three satellites will work in a constellation after launch.

More recently, we are participating in a lunar mission by designing a 3U lunar CubeSat to be deployed onboard Chang'e 6 mission which also hosts a number of payloads from international partners. The Asia Pacific Space Cooperation Organization (APSCO) in collaboration with China National Space Administration (CNSA) has provided its member states the opportunity to launch a payload onboard orbiter and also the possibility of deployment of CubeSat in the lunar orbit. The paper shall focus on key satellite design projects which are helping in space accessibility and education in Pakistan