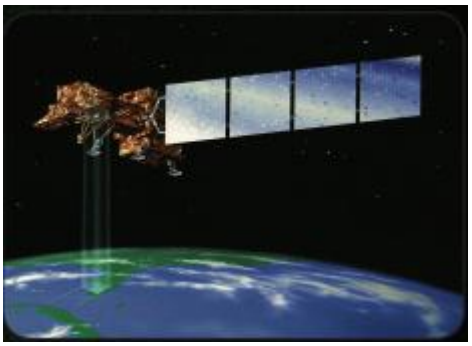
“Space” for growth

-Advait Kulkarni

We are close to completing our time in the second decade of the 21st century. An era of information, and era of connection and global connectivity. The time when we as a species are planning to explore the solar system in person. As we make our flight to the stars, we need to take care of the place we call home. This is the only place we call home for now. Humanity must acknowledge the problems that face the Earth. Natural disasters, climate change, and access to clean water are just a few of the serious issues that pose a threat to our world and our future. Space technology provides awareness of how the sustainability of the world is affected and contributes to its improvement. Industry should be challenged to assist in this process, not only because it has a social responsibility but because innovative business models can take economic advantage of carrying out their activities in a sustainable manner. Space technologies can help taking care of our home before we take off for the stars.

Remote sensing satellites that monitor the Earth as it changes over time. They offer consistent, accurate and relatively low cost data. This is invaluable to a wide range of socio-political, educational and industrial activities.



Position, Navigation and Timing (PNT) satellite systems that can be effectively used alongside Geographical Information Systems (GIS) for personal navigation, mapping and surveying, disaster relief, transportation, and emergency response.

Tele-communication satellites that transfer information across the globe, without requiring the extensive ground based infrastructure needed for terrestrial systems. They are used for education, health, and disaster warnings to remote locations across the globe.

In the last decade, natural disasters have increased in frequency and severity, causing over a million deaths and more huge financial damages. Disasters impacts get magnified with rising population, predominantly near the coastal areas, which are prone to flooding and cyclones. Space applications play a vital role in mitigating the impact of disasters. Estimates suggests that, in Australia alone between A$100 million per annum is saved by utilizing remote sensing data. Analyzing how space technology has been used in the past, when disaster strike, the immediate need of food, water, shelter and medical supplies are easily supplied and coordinated with use of space based communications. In case of damaged of ground based infrastructure, satellite systems can facilitate links between victims and relief workers. PNT satellites can provide accurate and fast positioning services for emergency response teams to coordinate volunteers, materials, and financial aid.

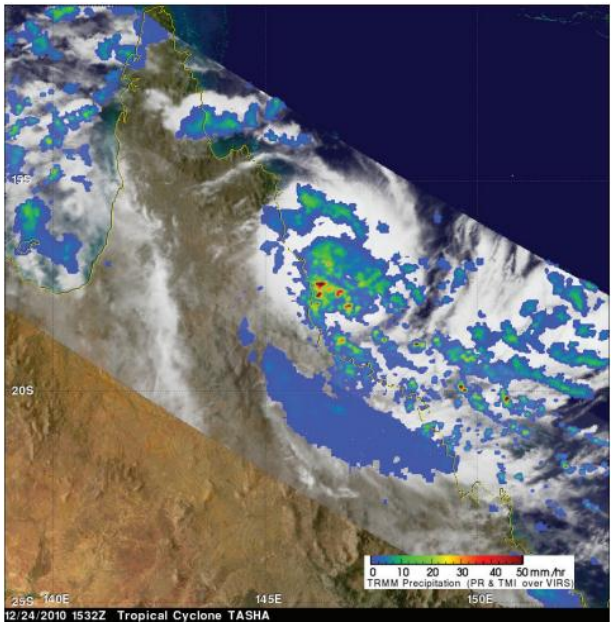
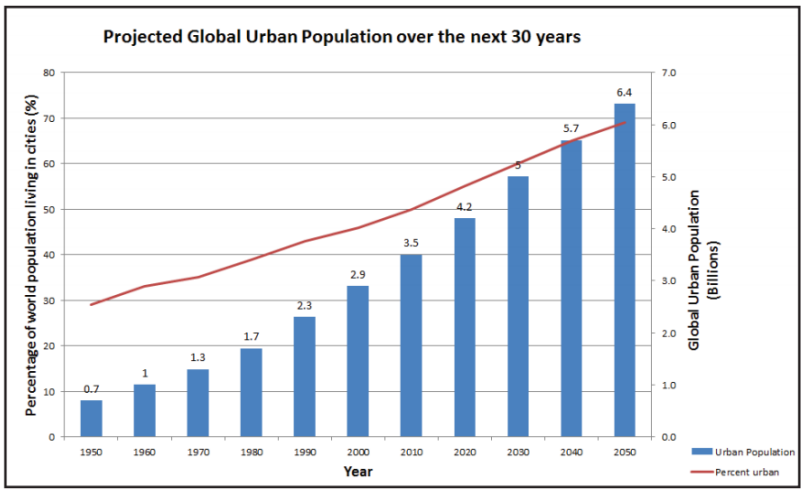


Figure 1 Precipitation of Queensland Cyclone

Space based data can also help in managing the sudden growth in urban areas. Increasing urban population is a result of global displacement from rural to urban areas. On an average more than five million people move to urban areas every month, resulting into informal settlements that lack proper planning and infrastructure. These settlements often have poor sanitation and little access to health and education facilities. Growing urbans areas in India like Pune, are home to highly populate informal settlements. It is examples like improved settlements conditions in Pune are proof of utilization of satellite data for better planning for resettlement. Informal settlements have benefited from remote sensing where spatial correlations between areas of land cover and land use patterns have been used to estimate the vulnerability to natural disasters in Earth Sustainability order to improve quality of life. Non-governmental organizations have used the data made available with remote sensing technologies in such areas to make governments aware of the problem and help formulate future policies to mitigate shortage of housing across India.



Space technology is also widely used in other areas like proving high speed internet services, traffic and vehicular movement supported using PNT satellites, remote sensing data used for improvement of agro technologies, and efficient use of resources for agro applications, education facilities using advanced space based communication. Space based communications have also proven wide application in health industry. Tele-medicine is crucial in providing doctor patient interaction over vast distances. This helps quality medical aid in situations where physical presence of doctor with the ailing is not possible.

Apart from all the technologies which are already in place and are one of the corner stone of our modern civilization; we also need to consider the technologies and infrastructure that advancing space technologies will provide in the coming time. We are already experiencing an explosion in the number of personal smart devices, and it is our generation that will see the growth of connected and smart devices like never before. With all our devices getting increasingly smart and connected, the need for better communication infrastructure will be necessary. This is where micro satellite technology in lower earth orbit will be of direct application and importance.

To conclude, space applications have seen wide use in all different aspects of our modern society. The one thing that makes the 21st century different from all the other times in history is our knowledge of outer space and utilization of space as a resource. We have been successfully able to utilize space so far but we need to do more we expect to sustain our life on this planet while taking care of our home. Space opens up a whole new aspect of research and possibilities, while also becoming a great weapon if militarized. Care must be taken all along that this is not done, and that space resources are used only for peaceful purposes.