

Satellite Remote Sensing and its Applications

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Satellite Remote Sensing (SRS)

The past two to three decades has seen a turnaround in our capacity to survey and map our global environment through use of satellite remote sensing technology. Digital sensors mounted on-board the remote sensing satellites scan vast areas of the earth's surface during day and night and beam this data to the satellite ground stations for further processing and usage. With their continuous development and improvement, remote sensing satellites are increasingly being utilized for socio-economic development and national security.

SUPARCO has over the years endeavoured to build competence and develop necessary infrastructure in the field of satellite remote sensing technology and its applications for undertaking nationally important projects for the federal ministries and provincial departments, public sector organizations, international agencies and the private sector. These efforts have borne fruit and the technology is now being extensively utilized for the socio-economic development and technological uplift of the country.

Applications of Remote Sensing Technology

Some of the areas in which satellite remote sensing technology has been applied with varying degree of impact in Pakistan are as follows:

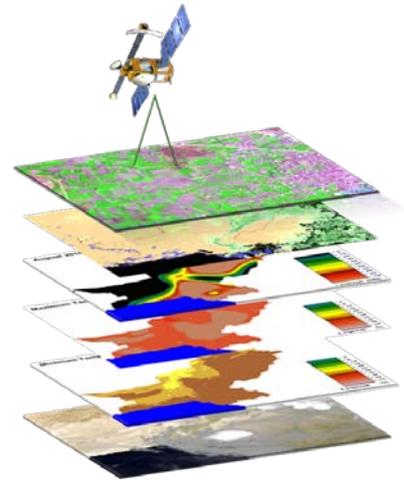
- Agriculture
- Disaster monitoring and mitigation
- Surveying and urban planning
- Water resource management
- Environmental monitoring
- National spatial data infrastructure
- Infrastructure development planning and monitoring
- Mineral exploration
- Telecommunication
- Coastal eco-system monitoring

A few of the projects undertaken by SUPARCO in the recent past are highlighted below:

Agriculture - Crop Monitoring, Forecasting and Estimation

Crop monitoring, forecasting and estimation is being carried out around the year using satellite remote sensing and other technologies to fortify food security and allied disciplines in the country.

A pragmatic beginning was made by providing production statistics of three contiguous districts of cotton-wheat zone in Punjab and Sindh in 2005-06. The project area was expanded subsequently to 44 districts during 2006-07 and now entire country is being covered for monitoring, forecasting and estimation of wheat, cotton, rice, sugarcane, and maize crops throughout the year. A monthly agriculture bulletin is also being issued and can be accessed on the SUPARCO web site www.suparco.gov.pk/pages/pak-scms.asp .



Disaster Monitoring and Mitigation

Remote sensing satellites can provide accurate and timely information of the disaster affected areas. Since the earthquake of 2005, SUPARCO has provided satellite imagery, damage assessment reports and other information to the disaster management and mitigation agencies. The turnaround time from a disaster occurring in Pakistan to the provision of imagery is less than two days. SUPARCO has also been involved in contingency planning in collaboration with UN agencies.



Watercourses Monitoring Under National Programme for Improvement of Watercourses (NPIW)

Project Monitoring Unit (PMU) of Govt of Sindh for the NPIW contacted SUPARCO for development of a system capable of real time monitoring and reporting of the field activities as well as repository of the irrigation network comprising 44,000 watercourses.

SUPARCO proposed an innovative solution which integrated satellite

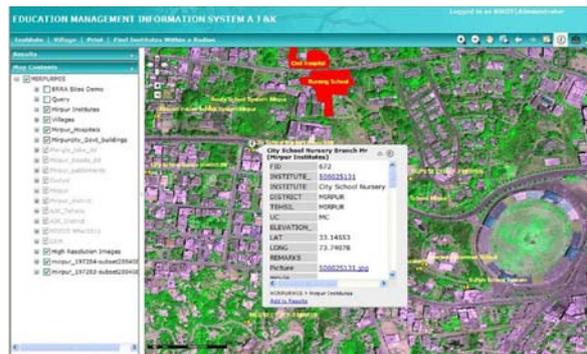


imagery, GIS, GPS and cellular GSM/GPRS technologies for real time monitoring of the improvement work and repository of the irrigation network. This solution greatly facilitated accurate and timely monitoring as well as updation of records.

The system has also been used for inventorying of 58,000 watercourses in Punjab and 74,000 in KP.

Landuse Mapping of AJK

The Land Use Planning Cell, P&D Departments, Azad Jammu and Kashmir (AJK) requested SUPARCO for the provision of latest information on land use, urban sprawl mapping and infrastructure. The latest satellite imagery was acquired for land use and urban sprawl mapping. A digital elevation model was developed and used for elevation information. It was supplemented with extensive ground surveys by SUPARCO / AJK teams. A database with special reference to education and health facilities in the AJK has also been developed.



National Environmental Information Management System (NEIMS)

This project endeavours to develop a National Environmental Information Management System (NEIMS) in collaboration with the devolved Ministry of Environment, UNDP and other partners. Under this project, a web based application is being developed to monitor and analyse environmental changes using SRS and GIS technologies.

Conclusion

Space based technologies and their applications are playing a key role, to optimize planning, implementation and monitoring of projects. The use of this technology in Pakistan is expanding. SUPARCO is endeavouring to facilitate its use by public and private sector through awareness and education campaigns. Extensive use of space technology applications can significantly contribute to enhance the pace of socio-economic development in several sectors.