



❖ CSSTEAP* Newsletter ❖

Quarterly Newsletter of Centre for Space Science and Technology Education in Asia and the Pacific (affiliated to UN)

Volume 4 Issue 3

September, 2001

Valedictory Address : Technology in the Development Phase of the Nation

Dr. A P J Abdul Kalam

Principal Scientific Adviser to the Government of India

I am indeed delighted to participate in the valedictory function of Post Graduate course on Remote Sensing and Geographic Information System organized by Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) at Indian Institute of Remote Sensing. My greeting to CSSTEAP and also to all the teachers and guides for the course and particularly Professor B.L. Deekshatulu, Director, CSSTEAP. I would like to congratulate the nineteen participants from thirteen countries of the Asia and the Pacific region for their successful learning and experience.



Bharat Ratra: Dr. A P J Abdul Kalam at valedictory function of Remote Sensing and Geographic Information System Course at IIRS, Dehra Dun

Remote Sensing Programme

I was thinking what to discuss with such internationally qualified post graduate gathering, who will be proceeding to their countries with the knowledge added in the Remote Sensing and Geographic Information System. I worked for ISRO for 20 years up to 1982 and also I am in close touch with ISRO's programmes, both in Polar Satellite Launch Vehicle and Remote Sensing Satellite Launch Vehicle. The

nation has the core competence to build its own launch vehicles and spacecraft for remote sensing and space communication. Most importantly India has gained the experience and knowledge of usage of Remote Sensing Satellite for national development relating to agriculture, water management, forecasting and estimating disasters and damage due to disasters. One of the contributions of Indian satellite is also imaging the forest areas, how it is decreasing and how it is increasing. This is a very important input which will make any nation enrich economically and provide better quality environment.

India Millennium Mission

Inside this issue

Valedictory Address:
Technology in the Development phase of the nation

An Agrohydro-climatic and Environmental Analysis of the Changes in Cropping Style in Bangladesh and their Impacts on Rice crop yield: A Combined



Contd. from page-1...

that will lead to national development with proper road map. The areas are : education and health care, agriculture and agro-food processing, information and communication technology, infrastructure development including electric power and critical technology development.

As all of you know, education and health care will give social security and population control and also provide employment opportunities. Agriculture and agro-food processing will lead to food security, employment, value addition and rapid economic growth. Information and communication technology will assist the rapid economic growth, export earnings, massive employment and reaching the whole country. Whereas the infrastructure development is common to all other developments and they are very crucial for all sectors. The critical technology development is vital for the national development and economic independence with the present geopolitical scenario.

I discussed with Prof. Deekshatulu, on the projects carried out by the participants of the course. He told me the typical problems being dealt, which are remote sensing, imaging and analyses on agriculture, particularly agriculture yield, water resource management, urban congestion studies and solution; and urban transportation etc. In this connection, I would like to share the results of two programmes relating to agriculture and urbanization. Once you go to your own country, you can contribute in a big way on various economic development programmes for using remote sensing for multiple applications.

Higher yield of agriculture production and technology

To put the vision into action, Government had provided certain funds in the budget of 2000-2001 for the experimental development tasks of agriculture, higher education, in certain industrial fields, multiple rural connectivity, power and certain advanced areas. I thought of sharing some experiences and results of working in three areas as examples. These are agriculture, advanced education and rural connectivity. These are built on our earlier experiences with mission areas of sugar, fly ash and composites. Prof. SK Sinha, a renowned agricultural scientist who was a former Director of IARI, and TIFAC took up a project on "A System's Approach to Enhance Agricultural Productivity in central Bihar and Eastern India". ICAR unit at Patna participated. About 6 villages of RP Channel-5 and nine villages of Majhauili distributaries were selected during the Kharif season of 1998. The system approach consisted of soil analysis, seed choice, cultivation season, fertiliser selection and training to the farmers particularly using remote sensing data. This intensive collaboration of scientists and farmers resulted nearly increase to 5 tons/hectare yield of wheat. This is spreading fast to other areas. Near about 200 villages are participating in the programme. It is also spreading to Devaria District of UP. When we visited a few villages where this systems approach is used, we found that the farmers are happy that the production has increased. Their income has increased too. Naturally these bring new issues like equipment for faster harvesting, storage, marketing and banking system. I am glad that they have come up with ideas for solutions and also are preparing to work together and share facilities.

There has been a very successful project for applying Remote Sensing to environmentally degraded land in Uttar Pradesh. The area chosen are high intensity Sodic land in the major canal commands: Upper Ganga, Lower Ganga, Ram Ganga, Sharda Sahayak. Sodic land intensity is high in the critical and semi-critical water logged areas and partly in the potential areas for water logging. In the project it was studied by the Uttar Pradesh Remote Sensing Department and along with other Departments in Uttar Pradesh under a World Bank funded project, there has been a very good success in reclaimed sodic land. Remote Sensing is also being used for subsequent study of why some of the reclamation measures have succeeded and why in some areas it has not worked. For example, one of the studies indicates that the status of sodic land reclamation is variable in different hydro geological conditions. There are a few such lessons derived from the project, which are useful for further enhancement to the reclamation efforts.

Contd. on page-3...

Contd. from page-2...

Rural Development (Rurbanisation)

Rural connectivity is possible with road and electronic connectivity. After considerable interactions in a few areas in the country, detailed projects are being evolved under India Millennium Mission 2020. The concept of the project emanates from the task team headed by Professor P.V. Indiresan. The fact that there is net migration from villages to cities indicates that, in the opinion of the rural people, cities are better places to live or they get employment for sustaining their family. Ideally, both rural and urban areas should be equally attractive with no net migration either way. Near zero net rural-urban migration is a mark of completed development. How can we achieve that happy state of affairs? Rural connectivity is the only solution and the details are described as a process, which:

- (a) Provides rural areas with all desirable amenities that are currently available only in cities;
- (b) Will generate as a consequence employment on the same scale, and at the same level, as cities do;
- (c) Will provide these benefits at a small fraction of the financial, social, cultural and ecological costs the cities have to bear.

Experience in India has demonstrated that the true handicap suffered by rural areas is low connectivity and little else. That lacuna may be rectified by linking together a loop of villages by a link road and high quality transport. That transport connectivity creates in those linked villages a large enough market to support a variety of services, which the villages will not be able to do individually. Thereby, the loop road and the transport service together convert those villages immediately into a virtual town with a market of tens of thousands of people. Such a well-connected rural space (combined with state of the art telecommunication connectivity) will have a high probability of attaining rapid growth by setting up a virtuous circle - more connected people attracting more investment, and more investment attracting even more people and so on. Basically, this proposal involves:

- (a) Selecting a ring of villages.
- (b) Connecting the villages on the ring by establishing a high quality transport and telecommunication system
- (c) Encouraging reputed specialists to locate schools, hospitals and other social services around the ring and
- (d) Marketing this well serviced space to attract industry and commerce.
- (e) Internet connectivity.

For the above work, needed core information is obtained from remote sensing data and analysed during every phase of the project. It can be seen that rural development is one of the important missions for transforming India into a developed nation as our country consists of 70 to 80% rural habitat. Apart from agriculture, road transportation, storage system, chilling plants, communication relating to multiple technology and management have to be networked.

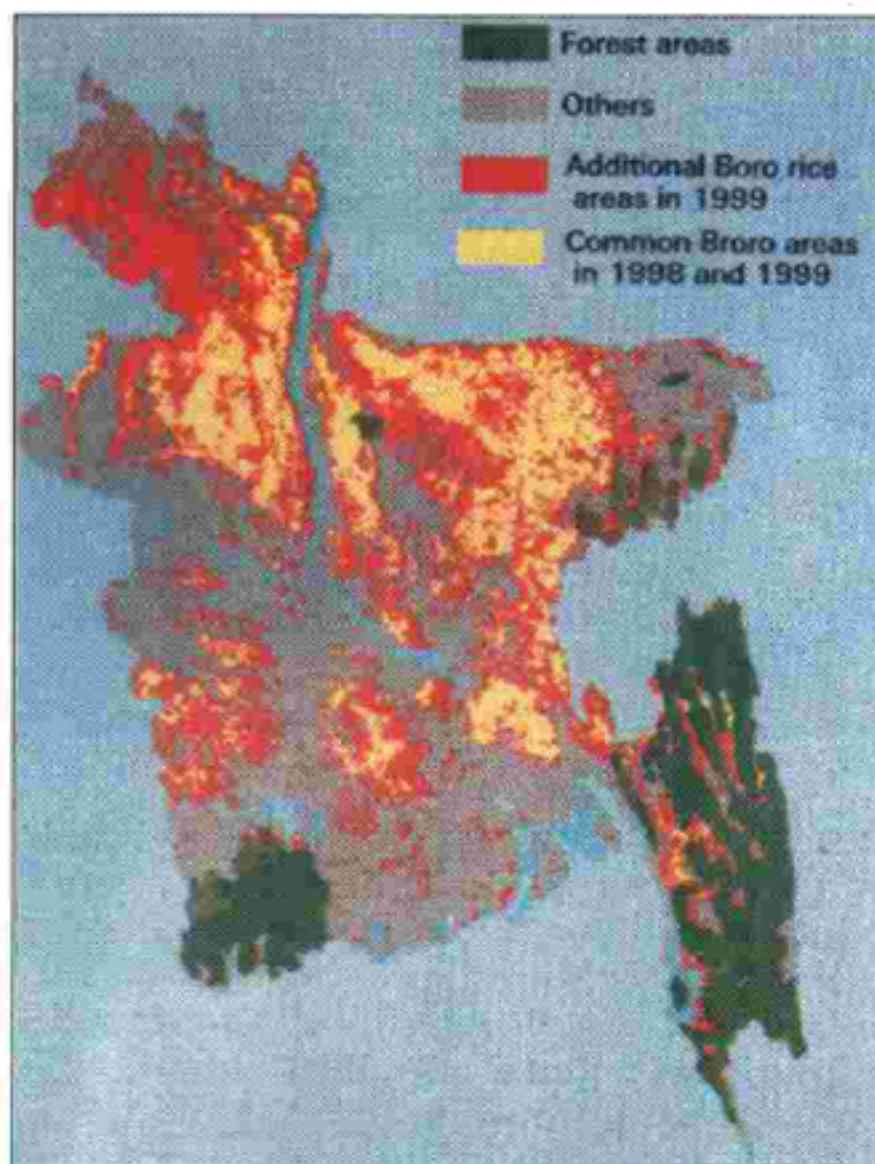
Conclusion

So far, I have presented the evolution of the vision for the nation, India Millennium Mission 2020, status, needed actions and certain experiences. The vision for the States and the India Millennium Mission 2020 will have the resource generation linkages. I find whenever the use, users and implementers as well as knowledge & skill possessors are linked and networked, success comes effectively and multiplies. As it is said, a networked resource can give a non-linear progressive addition to development growth. To reach from the GDP growth of 6% to 10% rates we need such non-linear steps. Friends, ignition of young population of any country, is one of the important resources. India possesses this in plenty. India has natural resources in all key sectors. It has a good knowledge base. Networking these is crucial to realise the strength. What we need today is to launch the Second Vision for a Developed India by 2020. For you, the participants of the Remote Sensing and Geographic Information System Course, you can carry with you the message of technology development tools including remote sensing and GIS and put to use in a big way in your countries.

An Agrohydro climatic and Environmental Analysis of the Changes in Cropping Style in Bangladesh and their Impacts on Rice Crop Yield: A Combined Remote Sensing and GIS approach.

*Md. Abdus Salam
Bangladesh*

Bangladesh is a densely populated agriculture-based country and rice is the major crop of the country. In the past two decades significant changes have occurred in the cropping style of Bangladesh. In this study, the impacts of present cropping style on the rice crop yields and their environment have been analyzed. This study presents an analysis on the existing cropping characteristics over the country in relation to land type, surface topographic characteristics and also includes an agrohydrological analysis of the crop cultivation. Temporal NOAA-AVHRR data were used to estimate district wise rice area for the whole country. The accuracy of rice area estimation over some selected districts in the country using NOAA-AVHRR data has been compared with that obtained from high resolution Landsat TM data acquired on approximately same date as that of NOAA-AVHRR. Comparisons between satellite estimated rice areas using digital technique and field observation based rice statistics show a good correspondences between the two. A countrywide digital cropping pattern map showing cropping intensity was also produced by use of digital crop inventory information and GIS based spatial analysis. Land evaluation for rice cultivation was carried out based on various information such as land inundation type, soil quality and ground water level using GIS. As the country is most vulnerable to flood, a part of this study was dedicated to the assessment of rice crop damages over the country by the devastating flood of 1998. A rice crop (Aman rice) damage map had been produced using digital analysis of NOAA-AVHRR derived NDVI image. Post-flood agricultural rehabilitation, particularly the post-flood



Comparison of Boro Rice areas in Bangladesh between 1998 and 1999. This map has been obtained by digital classification of temporal NOAA AVHRR data