



❖ CSSTEAP Newsletter ❖

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

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ADVISORY AND GOVERNING BOARD MEETINGS OF CSSTEAP

The sixth meeting of Advisory Committee (AC) and ninth meeting of Governing Board (GB) of CSSTEAP were held on May 11 and 13, 2004 respectively at Indian Space Research Organization (ISRO) Hqrs, Bangalore. Dr. Victor Kotelnikov of United Nations-OOSA, Vienna chaired the AC meeting. Dr. A.B Majumdar (IMD, Delhi); Dr. S. Namasivayam (Director, ACCIMT, Sri Lanka); Dr. Sjaak Beerens (ITC, The Netherlands); Mr. Wisinu P. Marsis (LAPAN, Indonesia); Mr. V. Sundararamaiah (Scientific Secretary, ISRO), Director, CSSTEAP; Dy. Director, CSSTEAP, Course Directors and course coordinators of various CSSTEAP courses and several senior officials of Department of Space attended the meeting. The committee took a review of the Centre's technical and academic activities since one year. Various issues like implementation of Board of Studies (BOS) recommendations, plan for research activities at the centre, membership of the AC, to send questionnaires for getting feedback of the past students, proposal for the Centres web portal, etc were discussed. The AC appreciated the efforts of the Centre for excellent progress made and expressed satisfaction at the achievements and also for support of the host country. The AC also nooted the committed efforts of the Centre, in particular its Director and the host institutions namely IIRS, SAC and PRL have made the centre reach such high levels. The AC endorsed the courses, future programmes and technical activities of the centre.

The GB meeting was chaired by Shri. G. Madhavan Nair, Chairman Governing Board CSSTEAP and Secretary, Department of Space, Govt. of India.

Members of Governing Board viz, Dr. Mahdi Kartasasmita (LAPAN, Indonesia); Mr. Dhahajjay Jha (Nepal); H.E Laura Quiambao Del Rosario (Philippines); Dr. S. Namasivayam (Director, ACCIMT, Sri Lanka); Dr. Kamol M. Muminov (Uzbekistan), Dr. Victor Kotelnotov (UN-OOSA); Dr. Sjaak Beerens (ITC, The Netherlands); Director, CSSTEAP, Course Directors of all courses and higher officials of various centres of Department of Space, Govt. of India attended the meeting. Several important issues like expansion of CSSTEAP in the Asia-Pacific region, review of the action items from the last meeting, the centre strategy for the research programme, etc. Chairman GB outlined future strategy of the centre and to make the centre broad based with the involvement as many countries of Asia-Pacific region to join the centre and to embark on obtaining international funding for the academic activities of the centre. He thanked the UN in particular, UN-OOSA, UN-ESCAP, UNESCO for



AC Meeting in progress



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biogeomorphology of the region.

- Impact of lake degradation on environment as well as microclimate.
- Generation of spatial database through GIS leading to the formation of action plans for a sustainable development of this coastal wetland environment.

In the present study, on Kolleru Lake, thematic maps have been generated based on the interpretation of satellite remote sensing data of three dates, one each in the years of 1992, 1997, 1999 and 2001 respectively. From each of these four dates, both geomorphological as well as land use/land cover maps have been generated. Thus, the resultant thematic maps show the landform conditions and land use/land cover patterns on 4 different dates spread over a period of about 9 years. These data sets have been subjected to GIS analysis which has revealed significant changes in the environment of the Kolleru Lake region.

The GIS analysis involves initially a very laborious process of conversion of all the analog maps into digital format by vectorisation. Once the task is achieved the subsequent computer analysis of these data coverages lead to the quantitative assessment of the temporal changes and their spatial patterns in the Kolleru lake region.

Broadly the changes in the Kolleru environment area that have been studied can be considered as three types, namely, morphological changes, land use/land cover changes and climate change (Figure 2). These are, however, human induced changes.

The Kolleru Lake, which occupies about 223 km² in 1992 and got reduced to 113 km² by 2001, was, in fact, a much larger coastal water body when it was formed in the geological past.

The temporal variations in the Lake spread during the recent years indicate that the Lake spread was reduced by about 110 km² between 1992 and 2001 mainly due to aquaculture activities.

Table 1: Changes in Land use/Land cover in the study area

| S. No. | Class id. | Land use / land cover class | Total area in km ² | | | |
|--------|-----------|-----------------------------|-------------------------------|-------------|-------------|-------------|
| | | | 1992 | 1997 | 1999 | 2001 |
| 1 | 1 | Settlements | 87 | 101 | 112 | 118 |
| 2 | 4 | Cropland | 1541 | 1320 | 1250 | 1204 |
| 3 | 5 | Current fallow | 137 | 4 | 24 | 57 |
| 4 | 6 | Plantation | 22 | 49 | 17 | 20 |
| 5 | 10 | Marshy area | 60 | 57 | 30 | 24 |
| 6 | 11 | Swampy area | 37 | 28 | 23 | 17 |
| 7 | 12 | Sandy area | 30 | 15 | 40 | 32 |
| 8 | 15 | Aquaculture | 300 | 713 | 795 | 855 |
| 9 | 16 | Lake water spread | 223 | 152 | 140 | 113 |
| 10 | 17 | Waterlogged land | 30 | 32 | 37 | 25 |
| 11 | 18 | Tidal channel | 17 | 14 | 17 | 15 |
| 12 | 19 | River/canal/drain | 10 | 11 | 11 | 8 |
| 13 | 20 | Goguleeru creek | 20 | 18 | 18 | 26 |
| | | Total | 2514 | 2514 | 2514 | 2514 |

The multi-date land use/land cover analysis revealed that the cropland has decreased by about 337 km² in nine years from 1992 to 2001 mainly due to the increase of the aquaculture.

The existence of alternate sets of beach ridges and lagoons between the Kolleru Lake and the present shoreline indicates (a) that Kolleru Lake was a coastal lagoon in the past and (b) that the coastline has prograded considerably due to deposition with some minor sea transgressions in between.

The borehole data from the emerged Lake plain area suggest the possibility of the Pleistocene origin of the Kolleru Lake contrary to the hitherto belief that Kolleru Lake was formed at the time of Holocene maximum transgression which reached 5 m above present sea level about 6 ka. However, further detailed studies are required to confirm this hypothesis.

The reduction of the Kolleru Lake by about 110 km² in just about nine years between 1992 and 2001 unambiguously reveal the alarming rate at which the Lake is degrading, due to human activities.

A comparative study of the land use/land cover maps generated from 1992, 1997, 1999 and 2001 satellite imagery indicated significant increase of aquaculture

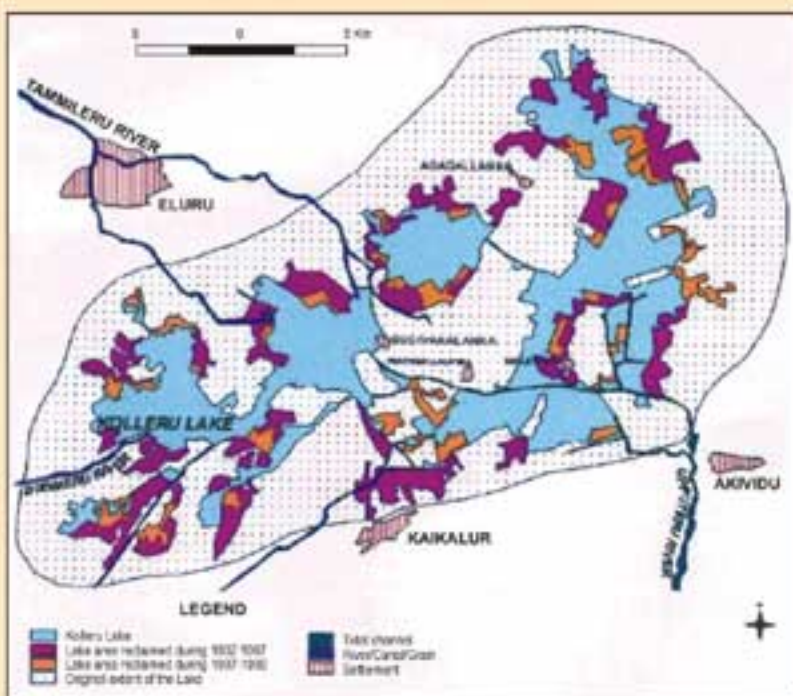


Figure 2

in the region (Table 1)

A GIS analysis of the 1992 & 2001 land use/land cover data clearly points out that aquaculture is encroaching on the Lake proper, cropland and marshy areas.

The large-scale encroachment and reclamation of Kolleru Lake area and digging up cropland for aquaculture ponds is by no means a desirable trend.

Apparently, the drying up of the Kolleru Lake is resulting in the reduction of rainfall in the region as revealed by the 3-decade data on rainfall recorded at 2 stations in the immediate vicinity of

the Lake.

The study highlights the significance of the remote sensing and geographic information systems in understanding the evolution and changes in the coastal wetland ecosystems, besides being helpful in data storage, retrieval and analysis in the versatile digital format, which forms a major component in the decision-making systems.

This is summary of one year follow up project of M.Tech degree awarded to the above student of RS & GIS course (2001-02) under the supervision of Dr. D. Mitra, IIRS & Dr. K. Nageswara Rao, Andhra University.

EIGHTH REMOTE SENSING & GIS PG COURSE

The Eighth Post Graduate Course on Remote Sensing and Geographic Information System (RS & GIS) which commenced on October 1, 2003 is in progress at Indian Institute of Remote Sensing (IIRS), Dehradun. 21 participants from 16 countries of Asia-Pacific region are attending the course. The course is ending on June 28, 2004, with a valedictory function. The three months Module-III which started from April, 2004, is basically designed for carrying out pilot project work by the course participants. The objective of this module is to make the course participant independent and capable to carry out research on their own towards accomplishment of natural resources inventory and



Field data collection for pilot project

management. The topics of the pilot projects were chosen by the course participants based on their area of interest, interest of parent organizations of the participants, expertise available at IIRS etc. The broad topics of the pilot projects



Participant making Seminar presentation

undertaken by the course participants in Module-III are Regional evapo-transpiration modelling; Spatial crop water requirement assessment; Soil and crop water balance study; Characterization of wheat growing agro-environment; Terrain slope stability analysis; Geological hazard assessment; Use of SAR interferometry in terrain analysis; Delineation of unstable slopes in hilly area; Irrigation water management; Management of torrential watershed; Flood information system; Flood mapping and damage assessment; Bio-diversity characterization at landscape level; Environmental vulnerability analysis; Analysis of green/ open areas in city; Mapping and monitoring of Urban land use; Coral reef habitat mapping; Retrieval of sea surface temperature and chlorophyll; Near shore substrate analysis and Coastal landform and land use study.

FOURTH POST GRADUATE COURSE ON SATELLITE COMMUNICATIONS AT SPACE APPLICATIONS CENTRE AHMEDABAD

The participants having gained all the knowledge on Satellite Communications theory and its applications were engrossed in putting the knowledge to the best use for the social upliftment of their country during their pilot project. Their project reports were reviewed studied in detail by the experts at SAC and the Course Director. The suitability and feasibility studies carried out were discussed and individual project guides played a vital role in giving their project a proper direction especially from the feasibility point of view. The pilot project work presentations were evaluated by a panel of experts headed by Dr. K.N. Shankara, Director, SAC, the Course Director, the Module Focal Points and the invited experts. The panel critically reviewed the pilot project presentations and gave valuable suggestions towards the suitability and the feasibility point of view.

The participants proceeded to the Andhra University as a part of the final tour of the course. The Pilot Projects were evaluated by the Professors at Andhra University, Vishakapatnam. The participants also spent time at the Andhra University and also got a glimpse of the Port city of Andhra Pradesh 'Vishakapatnam', also known as Vizag. In Vizag, the highlight of the local sight seeing was a monumental statue of God Shiva and his wife Goddess Parvati built on top of a hill appropriately called Kailashagiri. It was in Vizag that many of the participants saw Ocean and the Beach for the first time in their life.

Then the participants proceeded to Prof. Satish Dhawan Space Centre (SDSC), Sriharikota, the launching pad of Rockets in India. It was a dream come true for many participants to see the massive



Students receiving PG Diploma Certificates from Chief Guest

launch vehicle support steel structure and launch motors and launch vehicle pads. After an overnight stay at SDSC, the participants proceeded to Chennai for the last train journey back to Ahmedabad, thus concluding the series of technical cum cultural tours in India.

On their arrival the stage was set for the Valedictory function on the 28th April 2004. Dr. Shankara, Director, SAC, delivered the Welcome Address and introduced the Chief Guest, Padmashri. N. Pant, Member Space Commission and Guest of Honour, Mr. S.K. Das, Additional Secretary, DOS to the audience and on the occasion. Prof. Dr. Karl Harmsen, Director, CSSTEAP, gave a pictorial presentation describing the activities and the achievements of the centre. Mr. R.K. Gupta, Course Director, in his course report highlighted the various aspects of the SATCOM IV course and attributed its success to the constant guidance and direction by Dr. Shankara, Dr. Karl Harmsen and the entire faculty for its dedication. Mr. S.K. Das, released the Course CD on the occasion and in his address stressed the importance of the Satellite communications and its role in the developing countries. The Chief Guest, Mr. N. Pant, released the Memoirs and in his Valedictory Address gave an excellent statistical overview of the developments in the field of Satellite Communications. Mr. N. Pant presented the Diploma certificates to the successful participants while, Mr. S.K. Das presented the Award of Merit to the Rank holders. The participants finally departed to their respective home countries carrying with them the knowledge and memories of the exciting time they spent together in India with us.



Valedictory function of 4th SATCOM PG course

BACKGROUND OF CSSTEAP

In response to the UN General Assembly Resolution (45/72 of 11th December, 1990) endorsing the recommendations of UNISPACE-82 the United Nations Office for Outer Space Affairs (UN-OOSA) prepared a project document (A/AC.105/534) envisaging the establishment of Centres for Space Science & Technology Education in the developing countries. The Objective of the Centres is to enhance the capabilities of the member states in different areas of space science and technology that can advance their social and economic development. The first of such centres, named as Centre for Space Science & Technology Education in Asia & the Pacific (CSSTEAP) was established in India in November 1995. Department of Space, Government of India has made available appropriate facilities and expertise to the Centre through the Indian Institute of Remote Sensing (IIRS) Dehradun, Space Applications Centre (SAC) & Physical Research Laboratory (PRL) Ahmedabad. The Centre is an education and training institution that is capable of high attainments in the development and transfer of knowledge in the fields of space science & technology. The emphasis of the Centre is on in-depth education, training and application programmes, linkage to global programmes / databases; execution of pilot projects, continuing education and awareness and appraisal programmes. The Centre offers Post Graduate level and short courses in the fields of (a) Remote Sensing and Geographic Information System, (b) Satellite Communications and GPS, (c) Satellite Meteorology and Global Climate, (d) Space and Atmospheric Sciences. A set of standard curricula developed by the United Nations is adapted for the educational programmes.

The Centre is affiliated to the United Nations and its education programmes are recognised by Andhra University, Visakhapatnam, India for awarding M.Tech degree. (after completion of 1 year project).

Ongoing Courses

- Eighth 9 month Post Graduate course in RS & GIS at IIRS, Dehradun from October 1, 2003.

Forthcoming Courses

- Fourth 9 month Post Graduate course in Satellite Meteorology and Global Climate at SAC, Ahmedabad from August 2, 2004.
- Fourth 9 month Post Graduate course in Space Science, PRL, Ahmedabad from August 2, 2004.
- International Training course on Geoinformatics for Disaster Management at IIRS, Dehradun from Aug 16 - Sept 10, 2004
- Ninth 9 month Post Graduate course in RS & GIS, at IIRS Dehradun from October 1, 2004.

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CSSTEAP welcomes the views and opinions of the readers of Newsletter. Short Communications on space science and technology education which may be relevant to Asia Pacific Region are also welcome. Views expressed in the articles of the newsletter are those of the authors.