



Utilisation and Revalidation of Panchayat Resource Maps

Panchayat Resource Mapping (PRM) programme, implemented by CESS earlier, has generated plot level land and water resource data in cadastral scale. However, due to lack of adequate training in map reading and in extracting data from maps these maps could not be fully utilized. Utilisation of resource maps are also beset with the problem of time lag between the survey and the time of data use. Imparting adequate training to the volunteers selected from the Grama Panchayats to improve their skill in the utilization and revalidation of resource maps and to prepare development plans for the panchayat incorporating this spatial data was taken up by CESS on a request from the Thanneermukkom Grama Panchayat in Alappuzha district. The panchayat felt the need for such a training while attempting to implement a set of developmental activities, especially in the fisheries sector. Accordingly, CESS, organized a one day



Dr. T. M. Thomas Isaac, Hon'ble Finance Minister, Government of Kerala, inaugurating the training programme at CESS. Dr. M. Baba, Director CESS and Sri. U.B. Soman, President, Thanneermukkom panchayat are also seen on the dias.

Dr. Shailesh Nayak the new Secretary, MoES

Dr. Shailesh Nayak, Chairman of CESS Research Council has taken over as Secretary, Ministry of Earth Sciences, Government of India. Dr. Nayak was the Director of the Indian National Centre for Ocean Information Services (INCOIS) before joining the new position. He has been serving the Space Application Centre, Ahmedabad (ISRO) since 1981. Dr. Shailesh Nayak, a leading earth scientist and remote sensing expert in the country is the recipient of several honours and awards including the National Mineral Award for the year 2005 and the Indian National Remote Sensing Award for the year 1994.



training programme on 'Utilisation and Revalidation of Panchayat Resource Maps' on 14 January 2009. Dr. T. M. Thomas Isaac, Hon'ble Minister of Finance, Government of Kerala inaugurated the programme. The training module consisted of two components viz. theo-

retical lectures and group discussion. Theoretical lectures covered three main topics viz. panchayat resource mapping, surface water management for fisheries and action plan preparation. The use of data format for water related

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Mercury and other heavy metal pollution in Vembanad lake sediments

The Vembanad Lake with many rivers debouching into it is a unique fluvial regime. Pamba, Achankovil and Manimala rivers in the Southern region and the Meenachil and Periyar rivers in the northern region join the lake. Thus, most of the natural sediment supply of these rivers are deposited in the lake and only a small portion reaches the sea. The industrial growth, rapid urbanization, heavy dependence on chemical fertilizers and pesticides, lack of proper solid waste management system etc. put severe environmental stress on this fragile ecosystem.

The geo-chemical investigation of sediments from the hydrosphere of the Vembanad re-

gion, therefore, become a major subject of interest in research as it will reflect the current quality of the system and provide information on the impact of man. A research project on the geochemical investigations on anthropogenic mercury and other heavy metals like lead, cadmium, copper, zinc etc. was taken up. This two year research programme has also studied the seasonal variation of water chemistry for the pre-monsoon and post-monsoon seasons. The chemical analysis of heavy metals revealed that the maximum concentration of total mercury in lake water varied from 10 ng/l (monsoon) to 20 ng/l (non-monsoon). The

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Director Speaks



The humanity is deeply concerned about the climate change and its implications. The fear and concerns increased particularly after the recent IPCC report pointing towards the increasing global temperature and its impacts. The Government of India has already embarked on a national mission to understand the change and to contain the impacts in the country. At the regional level the State governments are yet to take full view of the issues related to climate change. In Kerala, the State Council for Science, Technology and Environment has taken a lead for a comprehensive programme on climate change which is expected to be funded by both the State and the Centre. The Research Council of CESS has been discussing implementation of a multi disciplinary project on climate change in CESS considering its wide range of expertise available in house and in the background some core programmes already being implemented. While approving a few core programmes related to green house gases, landuse changes and impacts on biodiversity it was suggested that to make the programme holistic it is necessary to integrate all aspects related to major economic activities. As advised by the Research Council, CESS has now initiated a large comprehensive pilot project on climate change. For this purpose it was decided to invite other institutions with multiple specialties to participate in this project. Now the programme is being enlarged with the co-operation of KAU, CWRDM, KFRI, CMFRI, CUSAT, TBGRI, NATPAC and CDS. The programmes being discussed include understanding of the climate change in the region, impacts due to climate change on various sectors, mitigation measures and strategic policy support to the government. An integrated programme is being drafted to cover a transect from the high ranges of Idukki district to Lakshadweep islands covering the midlands, plains and the Lakshadweep sea in between. The southern and northern boundaries are fixed as the Achankovil and Bharathapuzha basins respectively. CESS is inviting the national institutions like NIO, IISc, IITD and MSSRF to participate in the project. Support of MoES, DST and MoEF is expected. It is also expected that the project taken up for a period of five years will prepare a comprehensive regional data base on climate change and its impacts, examine the global models for regional application, suggest necessary guidelines for mitigation and provide the required inputs for policy formulation.

Dr. M. Baba

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information and fisheries development was also explained to the participants. Group discussion was conducted and hands-on training was given to volunteers to improve their skill in map reading and data extraction from cadastral maps. There was an evening session to deliberate on the future activities in detail. Dr. Isaac, along with Dr. Manoj, the Member of Parliament of the Alappuzha constituency attended and guided this session. Prof. M. K. Prasad, Chairman Information Kerala Mission took part in the evening deliberations. Dr. M. Baba, Director, CESS chaired both the inaugural session in the morning and planning session in the evening. Sri P Sudeep, Registrar, CESS proposed the vote of thanks. Dr.

Srikumar Chattopadhyay coordinated the training programme. Resource persons for the training were drawn from the Resource Analysis Division of CESS. At the end, a detailed plan was drawn up for data collection. Resource persons from CESS subsequently visited the Thanneermukkom panchayat for providing field training to volunteers and to liaison with the students of Kerala Fisheries College, who were collecting data on fisheries. A concrete proposal for fisheries development in Thanneermukkom Grama Panchayat was developed and a project document was prepared by the team. Seventy two volunteers including Thanneermukkom Grama Panchayat President participated in the programme.



Dr. Thomas Isaac interacting with the participants of the training programme

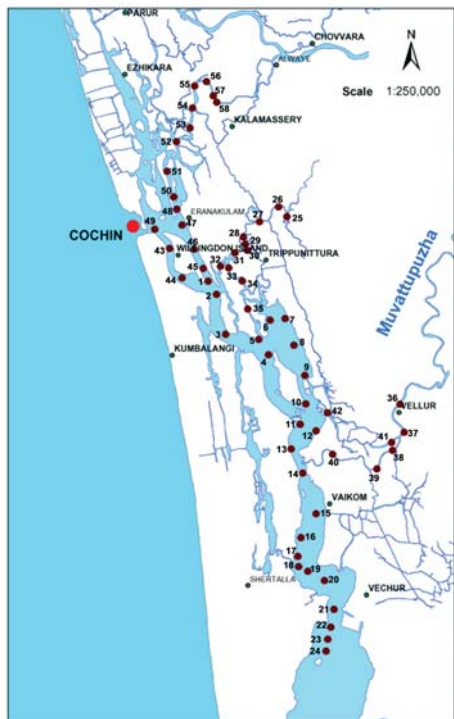
Mercury and other....(Continued from page 1)

total mercury concentration in the Periyar river water samples varied from 50 – 130 ng/l. Very high total mercury concentration was observed only at certain stations in Periyar river and in the Cochin estuary area. The untreated effluent discharge from different industries located on the banks of the river may be the main source of mercury pollution in the region

The maximum values for lead was noticed in water samples during non-monsoon months (2.1 – 2.6 ng/l). The mean concentration of cadmium was obtained for non-monsoon samples and is varied from 0.38 to 0.39 ng/l and the low mean value was recorded in monsoon season (0.28 ng/l). The copper content in lake water varied from 0.004-78.4 ng/l and is high

during non-monsoon season. The Cochin estuary and Periyar river samples contains more copper than the other samples. The Periyar river showed a minimum copper concentration of 6.3 ng/l and a maximum of 78.4 ng/l.

Total mercury in Vembanad lake sediments varied from 0.002 to 0.13 µg/g with a mean value of 0.03 µg/g. Higher values in lake sediments (0.13 µg/g) were obtained during pre-monsoon. During all the seasons the mean sediment total mercury concentration has shown very little changes and higher values were obtained for the sediments of Periyar river (0.12-12.20 µg/g). The mean concentration of mercury in Periyar river sediment was 2.65 µg/g. Total mercury and other heavy metals were determined for several fish samples of various



Sampling locations in the Vembanad Estuary

types available from the study area. Various parts of fish samples (gills, flesh and alimentary canal with liver) were analyzed for total mercury. Total mercury (THg) was observed mainly in fishes such as *Arius arius*, *Etioplos suratensis* etc., which are bottom feeders and omnivores. In *Arius arius* maximum concentration was obtained in alimentary canal (7.5ppm) where as in *Etioplos* it is in gills (3ppm). The THg concentration in mugil cephalus is minimum in flesh (0.5ppm) and maximum in gills (1.5ppm). *Macrobrachium rosenbergii* shown a maximum concentration of 1.69ppm. The bottom feeding fishes showed high concentration of total mercury.

Mercury, which is one of the major toxic heavy metals that undergoes methylation in the aquatic environment by both biotic (micro organisms) and abiotic processes. Mercury can also bio accumulate and bio magnify in the food chain.

Dr. P. K. Omana

Publications

Chattopadhyay, S.(2009) Geoenvironmental appraisal for sustainable development in Kerala. Earth System Science, Vol. II (Eds. A. Kumar, R. S. Kushwaha & B. Thakur) Concept Publication, New Delhi, pp. 494-509

Kurian N. P, Rajith K., Shahul Hameed T. S, Sheela Nair L, Ramana Murthy M. V, Arjun S, Shamji V. R (2009) 'Wind waves and sedi-

ment transport regime off the south central Kerala coast, India', Natural Hazards, 48: 259-273.

Kurian N. P, Nirupama N, Baba M, Thomas K.V (2009) 'Coastal flooding due to synoptic scale, meso-scale and remote forcing', Natural Hazards, 49: 325-345.

Panda Sampad Kumar and Sukumar B. (2009) Delineation of area for water conservation of Pervumba basin, Kannur district using remote sensing and GIS, Proc. National Conference of on Innovations and Recent advances in Geospatial technology, PSNA college of Engineering, Dindigul, pp. 1-7.

Invited talks

Dr. M. Baba, Director delivered an invited talk on 'Oceanographic inputs in CRZ and CMZ in the National Conference of Ocean Society of India - 'OSICON-09' organised by Andhra University on 20 March 2009 at Visakhapatnam.

Seminar / Meeting / Workshop

Dr. Srikumar Chattopadhyay attended the International Conference on 'Role of new technology in sustainable development: The case of Kerala' on 27 January 2009 and presented a paper on 'Technology use landuse studies: Application of GIS'

Dr. N. P. Kurian, Mrs. L. Sheela Nair, Mr. Praveen S. S, Mr. Shamji V. R, Mr. Arjun. S and Mr. Liju I. Varghese participated in the National Conference on Recent Developments in Ocean Science, Engineering & Technology (OSICON 09) held during 19-21 March 2009 at Vishakhapatnam and presented the following papers:

Numerical Modelling of Tsunami Inundation for the Southern Kerala coast by Praveen *et al*

Numerical Modelling of shoreline change in a coastal inlet area protected by breakwaters by Shamji *et al*

Numerical Modelling of changes in coastal sedimentation due to breakwater construction at Kayamkulam inlet, south west coast of India by L. Sheela Nair *et al*

Long-term coastal erosion at Kavaratti Island, Lakshadweep by T. I. Varghese *et al*

Numerical Modelling of flooding due to remote forcing along South Central Kerala coast by S. Arjun *et al*

Dr. Srikumar Chattopadhyay delivered a lecture on 'Sustainable Development' for participants of the Refresher course in Environmental Sciences in the UGC- Academic Staff College, University of Kerala on 5 March 2009.

Dr. Srikumar Chattopadhyay delivered a lecture on 'Ecological Security as a base for Social Security' for the participants in the International training programme on 'Universalising socio economic security' organized by ISS, The Hague, SEWA, Ahmedabad and CDS Trivandrum at Trivandrum on 9 March 2009

Dr. Srikumar Chattopadhyay delivered a lecture on 'Approach to Geography syllabus for Higher Secondary School' in the National consultative workshop for the development of Higher Secondary syllabus based on Kerala Curriculum frame work, 2007 on 13 March 2009 at Trivandrum.

Dr. K. Soman delivered a lecture on Coastal Zone Management : Perspectives alternatives at the Institute of Land and Disaster Management on 27 February 2009

Dr. (Mrs). Ansom Sebastian attended the National Seminar on Aquatic Chemistry (Aqasem'09), held at School of Marine Sciences (CUSAT) during March 26-28, 2009 and presented a paper entitled 'Geological and geochemical aspects, with special emphasis on rock soil hydro-geochemistry of Krishnapuram, Tamil Nadu State'.

Dr. N. P. Kurian delivered a lecture at the Institute of Land and Disaster Management on 'Coastal Hazards and Mangement: Kerala context', in the training programme on Coastal Management.

Exhibition



CESS participated in the exhibition organised as part of the XXI Kerala Science Congress during 28-31 January 2009 at Kollam.

Visit abroad

Dr. N. Subhash visited the Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria during 9-28 March 2009 as part of a collaborative project on 'Inactivation of pathogenic bacteria in periodontal diseases - Fluorescence diagnostics and photodynamic therapy', funded by DST, Government of India.

Project Reports

Soman, K (2009): Land use change and water quality: A case study in the Western Ghats province of central-south Kerala rivers. Report submitted to the Western Ghats Cell, Planning Board.

Chattopadhyay, S (2009): Land use/Land cover change and its impact on biophysical system: A case study of Pamba Agasthyamalai hill tract. Report submitted to the Director, CESS.

Earth Hour 2009

CESS coordinated the activities connected with the observation of the 'Earth Hour 2009' in Kerala on 28 March 2009. The main activity was to spread the message to voluntarily switching of the lights at 8.30 pm on that day and thereby firmly resolving to fight global warming. The World Wide Fund for Nature, Kerala Chapter; Kerala State Electricity Board, The Energy Management Centre, Doordarshan and many environmental activists joined the campaign spearheaded by CESS. A public meeting and a candle light vigil was also organised at Gandhi Park Maidan, Trivandrum. Mr. Suresh Gopi, Cine Artist participated as the Chief Guest of the function along with environmental enthusiasts. CESS broadcasted messages for the public through an FM radio service and prizes for radio quiz on climate change were given to the participants. According to an estimate of Kerala State Electricity Board nearly 20 % of the families in Kerala participated in the campaign and saved 540 MW of power.

Nomination

Dr. M. Baba, Director has been nominated by the Ministry of Earth Sciences, Government of India as a member of the COMAPS Review Committee.

Awards

Dr. M. N. Muraleedharan Nair has won the award for the best poster presentation for the



paper 'Assessment of Heavy Metals and Pesticides in the Reservoir Sediments of the Periyar River Basin' at the XXI Kerala Science Congress held at Kollam during 28-31 January 2009. The paper

was co-authored by Prasanth, M, Sinosh, P. K, and Jiji Kumar, S

Mr. S. Arjun, has been awarded the second best student paper award for his paper entitled 'Numerical modeling of flooding due to remote forcing along

south central Kerala coast' at OSICON '09 on Recent Development in Ocean Science, Engineering and Technology during 19-21 March 2009 held at the Center for Studies on Bay of Bengal, Andhra



University, Visakhapatnam. The paper was co-authored by Ms. L. Sheela Nair and Dr. N. P. Kurian

National Science Day 2009



Dr. M. Baba, Director, CESS inaugurating the Science Day programmes

CESS observed National Science Day on 28 February 2009 with the focal theme 'Expanding Horizon of Science' jointly with the Kendriya Vidyalaya, Air Force Station, Trivandrum. The programme conducted at the Activity Hall of the school, was attended by more than 120 students from class IX and class XI. Smt. P. S. Geothi Nair, Principal of the school welcomed the gathering. Dr. M. Baba, Director, CESS delivered the inaugural address highlighting the importance of the National Science Day and the expanding horizons of various branches of science and their impact on human life. He called upon the students to emulate Dr. A. P. J. Abdul Kalam who was the first Indian scientist to become the President

of our country. Dr. Srikumar Chattopadhyay, Scientist, CESS gave a lecture on 'Advances in technology for landuse study: Application of Remote sensing and Geographical Information'. Dr. Chattopadhyay traced the history of landuse mapping and explained to students the usefulness of Remote Sensing and GIS tools in landuse mapping. He also cited examples of student's participation in landuse mapping in UK, India and Kerala. Dr. G. Mohan Kumar another scientist from CESS talked on 'Trace Gases in the Earth's Atmosphere'. The emerging concern in the scenario of the present climate change was also presented. The students also discussed the techniques of measurement, present levels and the mutual interaction of Green House Gases with Dr. Mohan Kumar

Retirements



Sri. G. K. Suchindan, Scientist-F and Head, Training & Extension Division retired on 31 January 2009. He was instrumental in establishing the digital library and

LAN Facility in CESS. Sri. Suchindan was also the Public Information Officer of CESS.

Smt. P. Girija, Office Assistant Grade 1, CESS Library retired on 31 March 2009

